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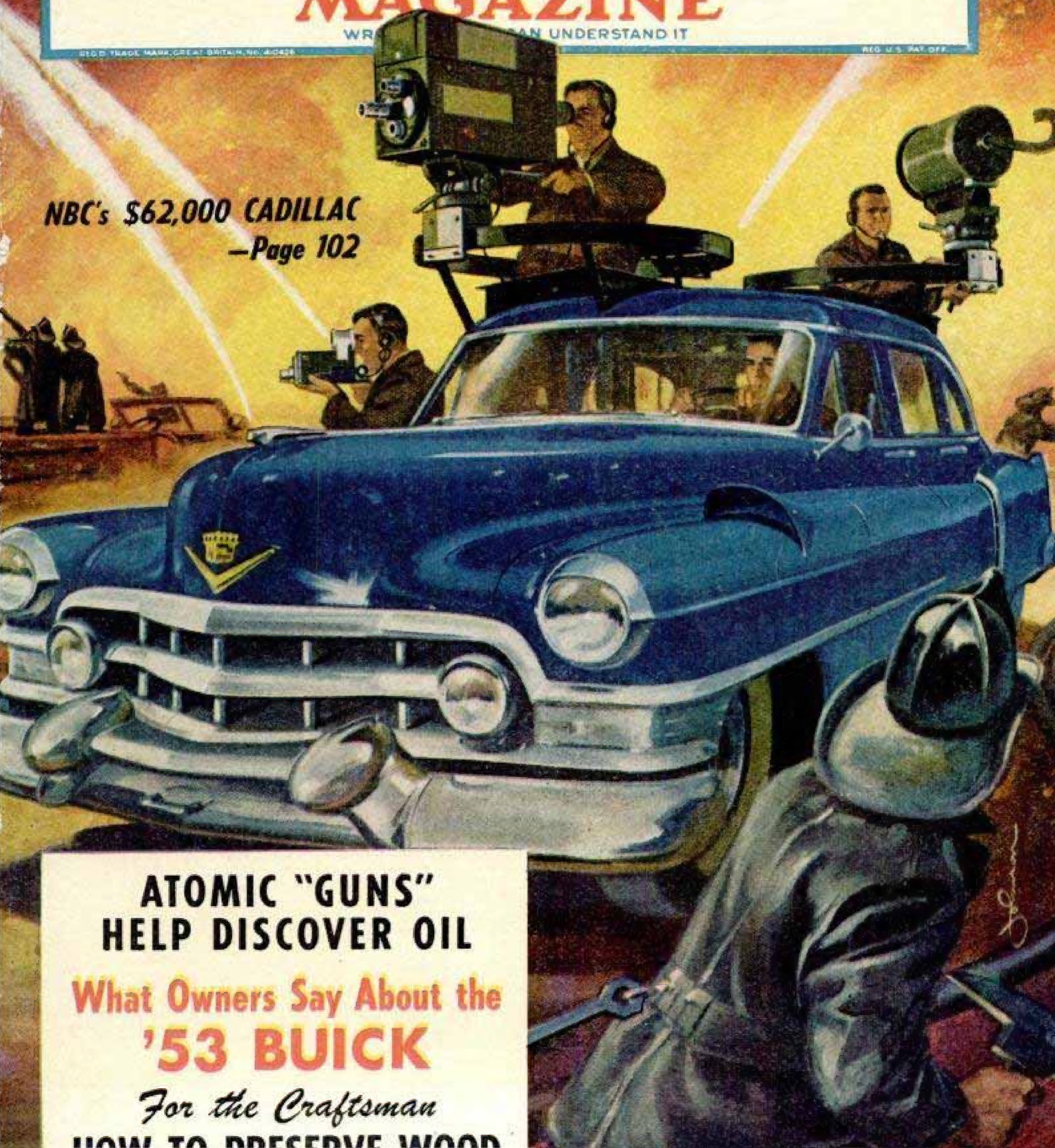
# POPULAR MECHANICS MAGAZINE

WE CAN UNDERSTAND IT

REG. D. TRADE MARK, GREAT BRITAIN, NO. 40022

REG. U.S. PAT. OFF.

*NBC's \$62,000 CADILLAC  
—Page 102*

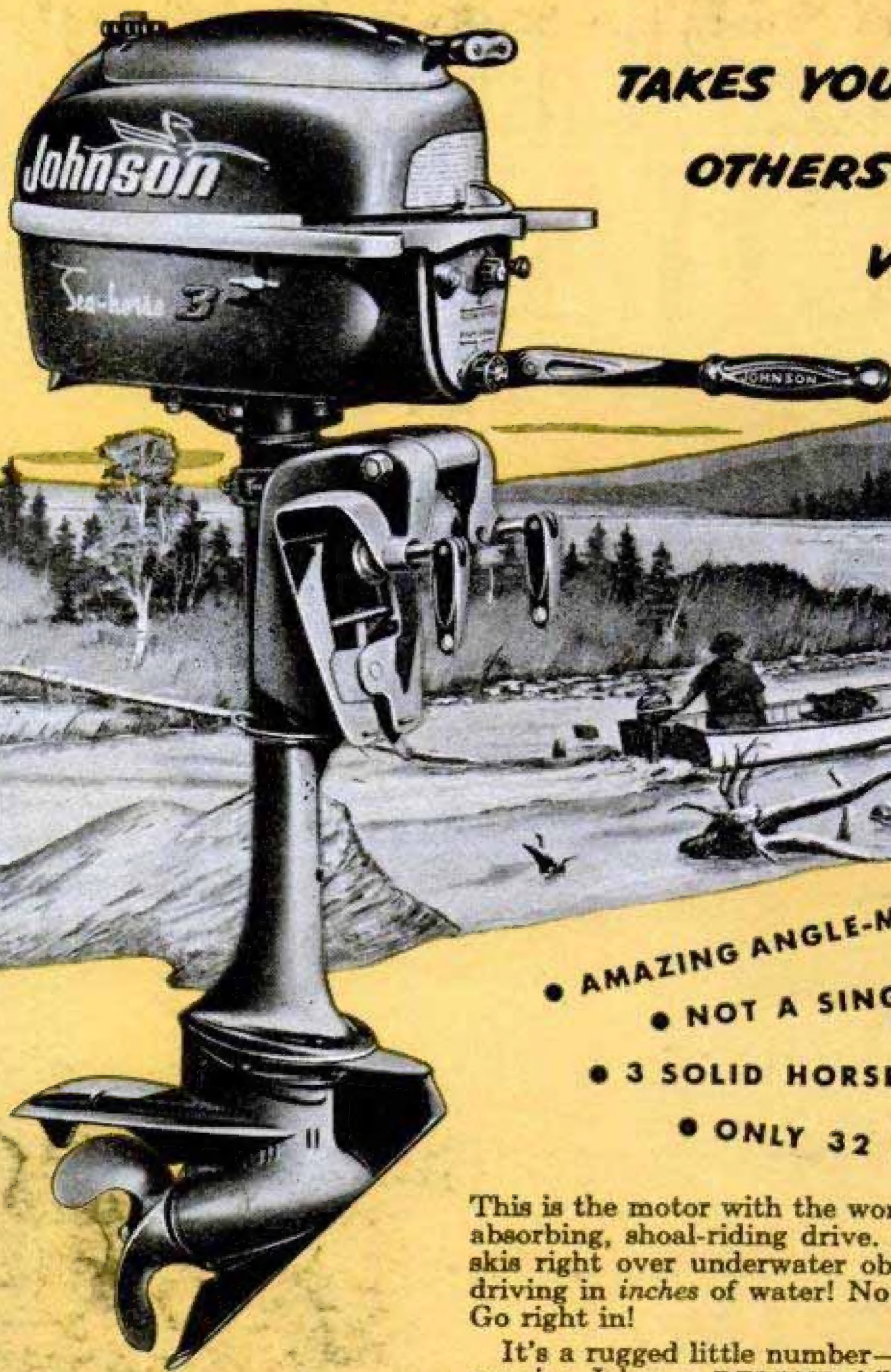


**ATOMIC "GUNS"  
HELP DISCOVER OIL**

**What Owners Say About the  
'53 BUICK**

*For the Craftsman*  
**HOW TO PRESERVE WOOD**





**TAKES YOU WHERE  
OTHERS DARE NOT  
VENTURE!**

- AMAZING ANGLE-MATIC DRIVE
- NOT A SINGLE, BUT A TWIN
- 3 SOLID HORSEPOWER
- ONLY 32 POUNDS

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This is the motor with the wonderful weed-free, shock-absorbing, shoal-riding drive. It slides through weeds, skis right over underwater obstructions and keeps on driving in inches of water! No more fishin' the fringes. Go right in!

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**FREE!** Write for new Sea-Horse Catalog. Describes the 4 great Johnsons for 1953. See your Johnson Dealer. Look for his name under "Outboard Motors" in your classified phone book.

**JOHNSON MOTORS, 400 Pershing Road, Waukegan, Illinois**  
In Canada: Manufactured by Johnson Motors, Peterborough

### **FOR 1953 — 4 GREAT ALTERNATE FIRING TWINS**

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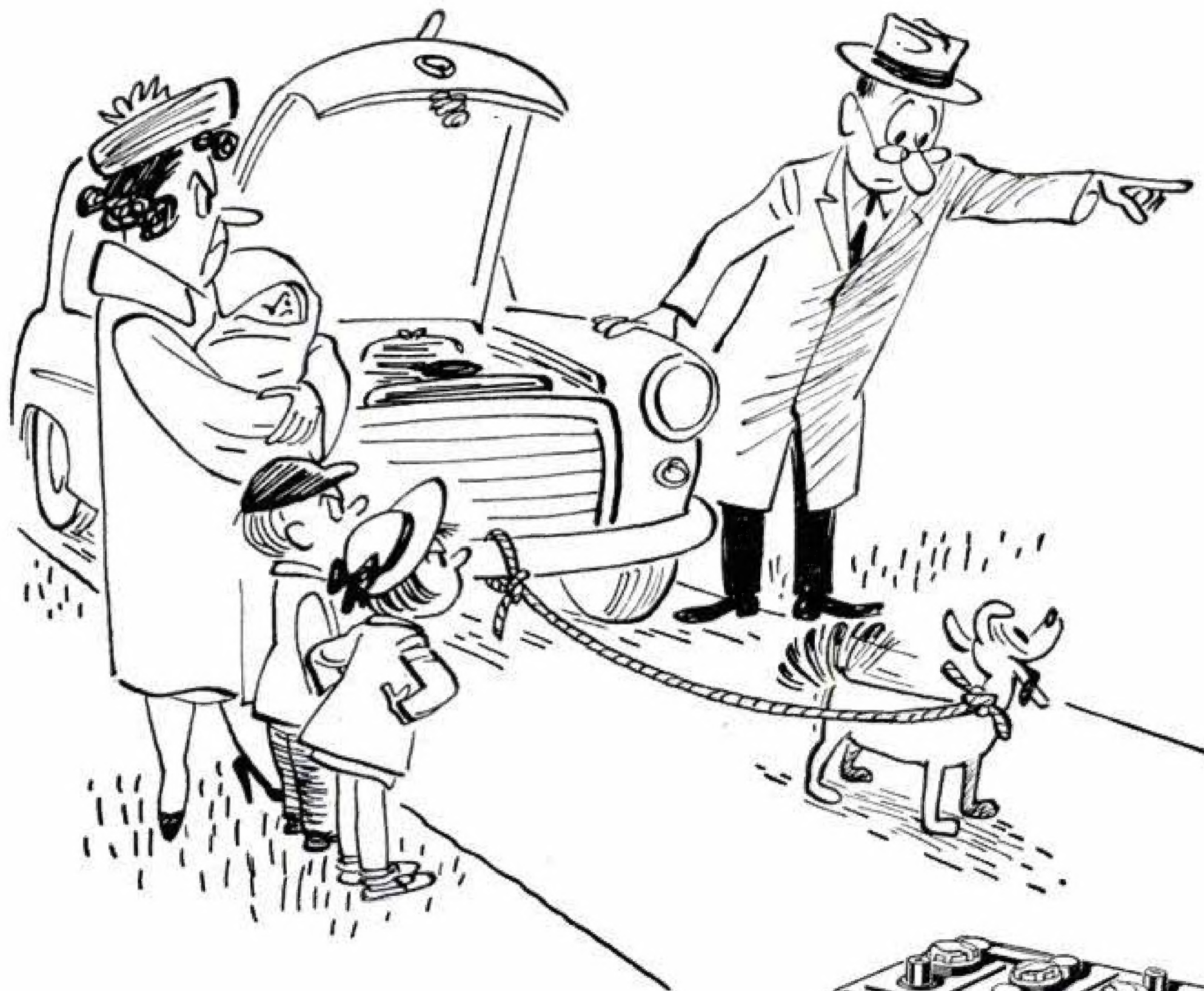
\*Prices are f.o.b. factory, subject to change. OBC Certified brake hp at 4000 rpm. Weights are approximate.



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OUTBOARD MOTORS**

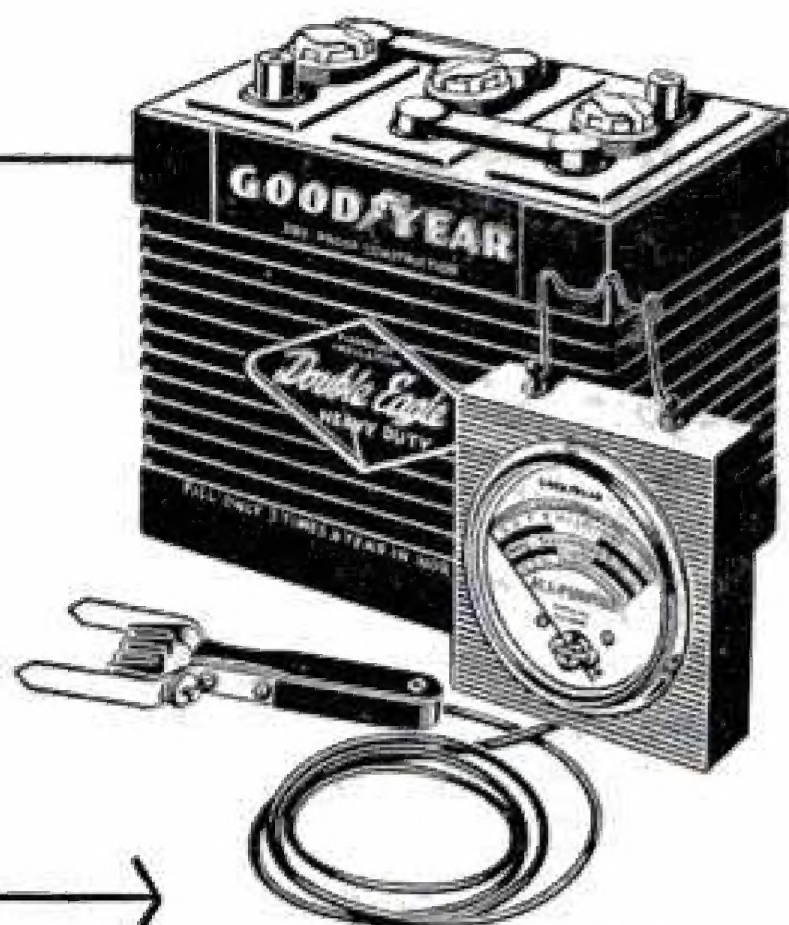


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New Cars as All Other Makes Combined**





# Popular Mechanics Magazine

Registered in U. S. Patent Office and Canada

H. H. WINDSOR, Founder

H. H. WINDSOR, JR., Editor and Publisher



## this month's cover

RIGHT UP to the edge of the inferno rolls the sleek Cadillac. Hatches in the roof slide open and two figures pop up to man the camera and antenna. Seconds later, television viewers 3000 miles across the country have a front-row seat at a major disaster. The strange vehicle is NBC's \$62,000 Cadillac, a standard auto pulled off the assembly line and packed with a ton of telecasting equipment. The steel rings of standard Army machine-gun turrets are mounted on the roof. One supports a camera, the other a barrel-shaped antenna. Inside the limousine's trunk a generator whirs out the electric power to run this studio on wheels, which can bounce a signal 20 miles to the home station for relay across the country. This wandering and wonderful studio can move anywhere a fire truck or ambulance can go. For more details, with news on TV's new "industrial monkey" and hand camera, see page 102

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## IN THIS ISSUE

Those Fabulous Flying Fords - - - - -	65
10-Minute Service for a Streamliner - - - - -	72
The Frontier Lives Again - - - - -	82
Now They're Hunting Oil With Atomic "Guns" - - - - -	87
What's Happening in TV Around the World - - - - -	93
NBC's \$62,000 Cadillac - - - - -	102
Robots Sort the Mail - - - - -	106
What's New for Your Home - - - - -	110
The Owners Report on the '53 Buick V8 - - - - -	118
Will America Win at Le Mans? - - - - -	126
Lumber From "Toothpicks" - - - - -	134
Tools for Your Lawn and Garden - - - - -	140

## For the Craftsman

Panel Your Home With Plywood - - - - -	150
The Ghost of Old No. 278 - Part II - - - - -	158
Beating Wood Rot to the Punch - - - - -	172
Make Your Own Surf Rod - - - - -	177
Lightweight Tent for Hikers - - - - -	182
12 Ways to Save Gas - - - - -	187
35-mm. Carrying Case - - - - -	192
Special-Purpose Planes and Scrapers - - - - -	197
Vacuum-Cleaner Motor Drives Flexible-Shaft Tool - - - - -	203
Shopping for Tools - - - - -	208
Radio, TV and Electronics - - - - -	211
Clinic for Homemakers - - - - -	218

Other items, and manufacturers of available products described, are listed on pages 12, 14 and 16



## Do You Know?

# How Nash Airliner Reclining Seats Turn into Twin Beds in 30 Seconds?



**1** At lever touch either front seat back adjusts to any of five comfortable positions. Right-hand seat, fully reclined, makes a wonderful "couch" for children's or passenger's naps.



**2** No longer need the driver sit rigidly in one position. Just touch a lever and change the angle of the seat back. Tall men say it's the greatest idea yet for comfort on long drives.



**3** All the comforts of home! Your Nash dealer offers easy-to-inflate air mattresses and special window screens at small cost—providing a wonderful home on the road for you.



**4** Twin Beds in 30 seconds! Both front seat backs recline to fill space between front and rear seats, creating roomy Twin Beds for hunters, fishermen—everyone who travels.



Reclining Seats and Twin Beds are just two of the scores of exclusive Nash features available. See and drive the new 1953 Airflytes, styled by Pinin Farina, at your Nash dealer's. Take the key and see—"there's none so new as Nash for 1953."

Nash Motors, Division Nash-Kelvinator Corporation, Detroit, Mich.



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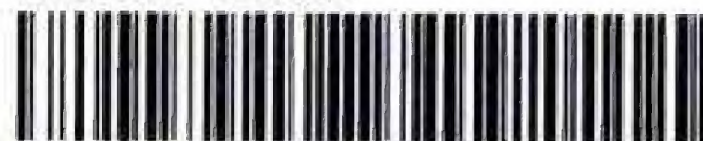
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in this corner.....

## THE EDITORS



### To the Editor:

Just to let you know we have completed the Sea Craft 25-ft. cruiser as shown in your magazine some time ago (Mar. 1948). We started planning this job in April 1951



and decided to build it. We laid the keel in June 1951. Using only spare-time hours, Saturdays and holidays, we completed the cruiser in one year, or about 1000 hours.

We are well pleased with the performance of this cruiser. It will make 15½ miles per hour using a 95-horsepower Chris Craft engine with a 14 x 12 prop. We increased the thickness of the planking (by mistake in lumber lists) by ⅛ inch, thus making the planking 7/8 inch instead of ¾ inch. We used light Philippine mahogany for the planking, structural fir for the keel and white oak for ribs and framing inside. This job carries 38 gallons of gasoline and 40 gallons of fresh water in a copper tank. We made four bunks in it instead of the two shown in the plans. We changed the windshield design due to the lack of proper materials; this was the only big change. We followed the plans issued by *Popular Mechanics* and things worked out swell.

Leon H. Preston  
Thomas N. Cox  
Paintsville, Ky.

### To the Editor:

In reply to the readers who disagree with the three Detroit automotive engineers:

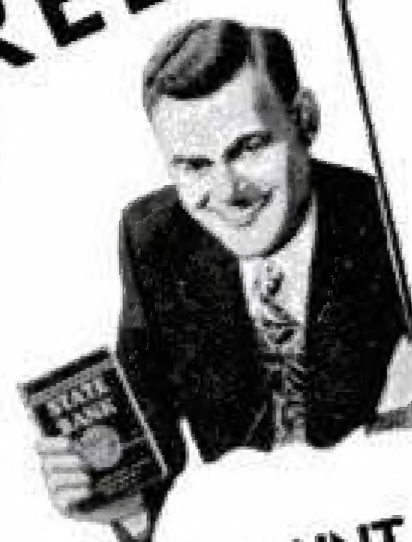
I am an English automobile mechanic now living in this country. Having worked on all English and most Continental and American cars, I think I am in a position to reply to readers who compare American cars with such names as Hispano-Suiza, Mercedes-Benz, etc. Let's be fair and compare prices as well. A Bentley sells for \$15,000 to \$20,000 and a Packard sells for \$2700. A reader asks why a European

(Continued to page 8)





To the man who wants  
an **ACCOUNTANT'S**



to enjoy  
**CAREER**

**IF** you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of \$4,000 to \$10,000?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing*!

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an accountancy position?

Just suppose you were permitted to work in a large accounting house under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex—soon you'd master them all.

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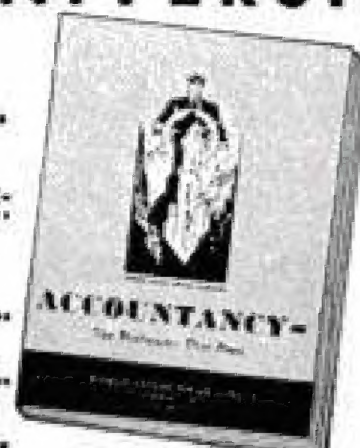
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**MENNEN**  
*Cream Hair Oil* **FOR MEN**

(Continued from page 6)

engineer gets 125 horsepower from a 91-cubic-inch engine. I wonder if he knows how many revs these engines do to produce that horsepower and also how much maintenance it requires to keep it producing the horses.

Forgetting the Alfas and Mercedes, etc. (let me say that I think these cars are in a class of their own in price, performance and engineering), the workmanship, design and materials used on the lower-priced European cars are far inferior to ours. One only has to inspect them closely to see that.

Finally, it is my opinion that this country, dollar for dollar, is far ahead in design, workmanship and materials. If you want proof just look at the number of English manufacturers who are trying to copy American design.

John R. Nightingale,  
Norwalk, Conn.

## To the Editor:

Reading your Editor's column in the April issue, I was very surprised at some of the readers' comments.

I sincerely believe the article ["American Engineers Look at Foreign Cars," Feb. 1953] was written strictly from an American engineer's point of view and was not intended as a cross section of the average layman's ideas. After all, those foreign cars were designed for an entirely different terrain and are used in circumstances that are nonexistent in this country.

As for a "mushy" ride, I would certainly prefer a softer ride such as given by American cars to a buckboard ride like those of the majority of foreign cars. After all, as bad as our roads are, they do not consist of hairpin, mountainous roads and all of our driving does not consist of "correcting a bad skid with a car that has to have five turns of the steering wheel."

Our cars are designed to please the customer. If our engineers didn't please the customer, they wouldn't be working long. As for boulevard rides and automatic shift, I can't see spending upward of \$2500 for an automobile and still having to shift gears. Ask anyone who lives in a reasonably large city and has to do any amount of traffic driving what he thinks of automatic transmissions. Thank goodness, someone had the initiative to invent an automatic transmission.

Of course, some will stick with the gear-shift, just as there were some who said "get a horse" when the first automobile came out. After all, we don't use candles or gaslights when electricity is available.

(Continued to page 10)



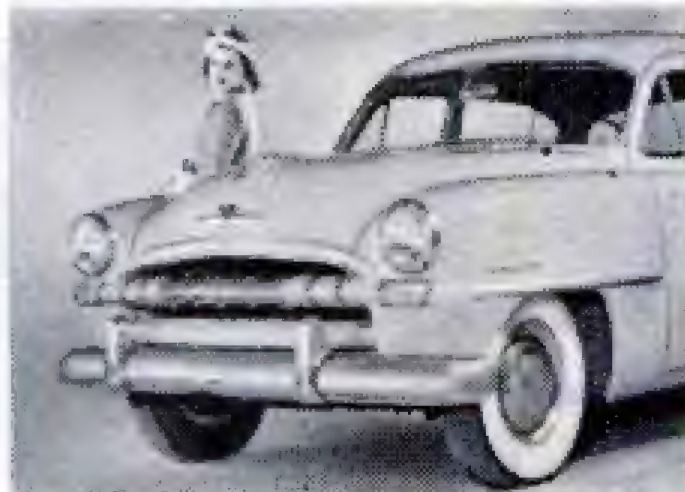


# GO FARTHER FASTER!

You will make good—*eventually!* But why wait until you're 50 or older? Start now to enjoy the things you want. *Go farther faster!* Win promotion over more experienced men. Gain the respect and admiration of others. Use the hours they waste to put yourself ahead. Famous International Correspondence Schools can lead you step by step up the unmarked path to personal triumph. Doubt it? Then just let I. C. S. prove it—*without cost or obligation.*



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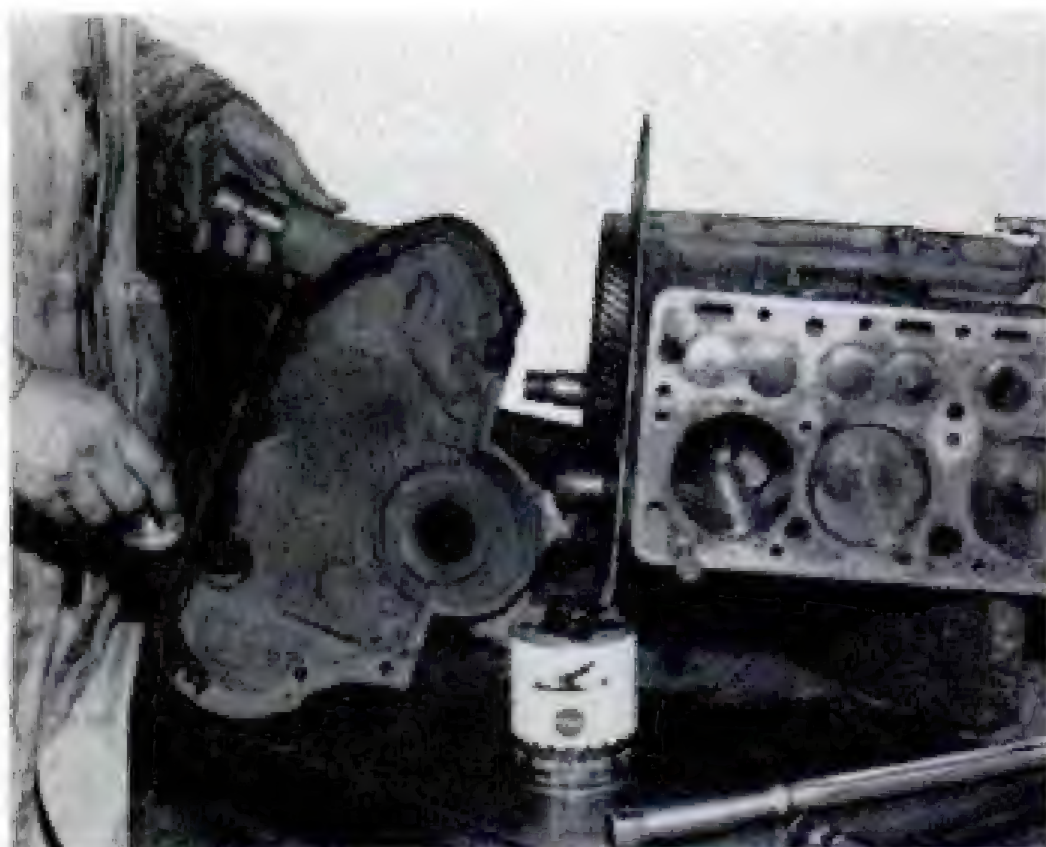
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(Continued from page 8)

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### To the Editor:

My opinion of the current cars gets lower with each new model. . . . I recently had occasion to see a few new foreign cars and inspect them to my satisfaction. Included were a Morris Minor, Singer, Jaguar and the Bentley. As I suspected, the buyer that can see past the speedometer would see a few features of quality, such as doors that fit and close without a mighty slam that requires . . . training and a prodigious windup.

I also noticed that the upholstery was of top quality and put in straight, not like the "glamorous" American car where it looks like tinted cheesecloth tacked in at an amateur dart throwers' convention. The hardware is like comparing something from Tiffany's to the merchandise at the local five-and-dime store. I could go on and mention the fact of economy, of better gas and tire mileage, but I'll save that for my discussion of the past and present as far as Detroit is concerned.

My own car is a 1940 Plymouth and is a gem. I get good gas and oil mileage (20 miles per gallon and 800-1000 miles per quart of oil). I have no squeaks, leaks, rattles or "sass" from it. So do you know what I am going to do when it starts showing its age? Unless Detroit starts building cars like before the war, I will buy a noisy, efficient, well-built import. Or else I will spend \$1000 to have the old car rebuilt. I don't think there is enough good steel in our cars to make a fistful of self-respecting bolts for a Rolls-Royce. . . . American designers have lost sight of the primary purpose of a car, to wit: A travel device.

In our cars, it seems that the thickness of the fender decreases with each addition of horsepower. The chrome on my car is 13 years old and is in better shape than that on many of the 1952 models which show rust after only one year. The first manufacturer who announces that he is out of the horsepower race and in the quality and economy races may sell me his product. . . . I don't care if I get somewhere 10 minutes sooner, I want to be able to keep going there in a dependable car that will keep a presentable appearance without an excess of automotive cosmetics.

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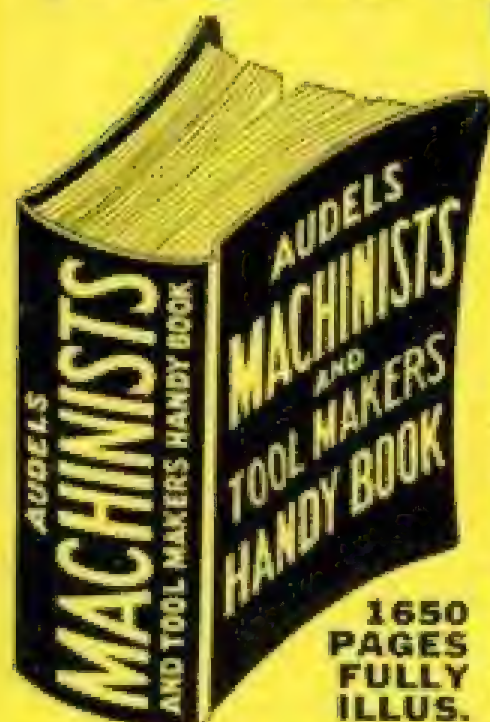
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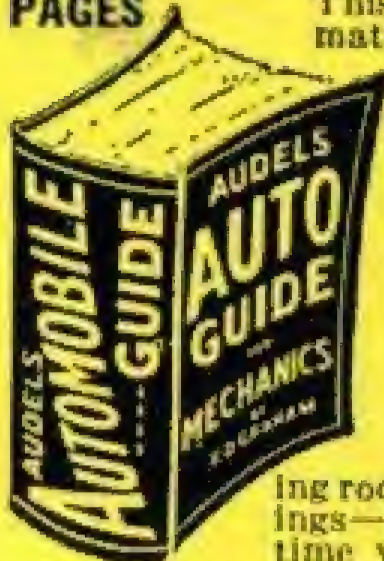
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## WHERE-TO-BUY-IT INDEX

Source of supply appears after items commercially available

### AUTOMOTIVE

Spark plugs cleaned in engine (Sharon Mfg. Co., 1685 N. Milwaukee Ave., Chicago 47)..... 70  
Chrysler's D'Elegance has pop-up spare tire..... 92  
Electrostatic ignition won't burn spark plugs (Heckethorn Mfg. & Supply Co., Littleton, Colo.)..... 105  
Sports car evolves from Indianapolis racer (Kurtis-Kraft, Inc., 4625 Alger St., Los Angeles 36, Calif.)..... 108  
Detroit Listening Post..... 109  
Traffic safety light on truck gives motorists signal to pass (Edward's Air Hose Bracket Co., Box 860, Sapulpa, Okla.)..... 123

### HOUSE AND HOME

Portable humidifying unit (Admiral Corp., 3805 Cortland St., Chicago 47)..... 110  
Aerosol dust catcher (Endust Corporation, 418 6th St., N.W., Washington 1, D. C.)..... 110  
Tumbler holder (Downs & Co., 1326 Greenleaf, Evanston, Ill.)..... 110  
Compact dishwasher (Cribben & Sexton Co., 700 N. Sacramento, Chicago 12)..... 110  
Decorative table (Olde Mill Products, 112 Vermont Ave., Clarksburg, W. Va.)..... 111  
Cookie cutter (Artistic Glass Studios, Box 544, Freeport, N. Y.)..... 111  
Sash holder (Sash-Jack Co., 1326 30th St., Rock Island, Ill.)..... 111  
Disappearing holder (Hall-Mack Co., 1344 W. Washington, Los Angeles, Calif.)..... 111  
Rubber tabs (House of Morrow, Box 117, Wilmette, Ill.)..... 112  
Indoor barbecue (Odin Stove Mfg. Co., Erie, Pa.)..... 112  
Plastic scoop (Lloyd Disher Co., Box 1184, Decatur, Ill.)..... 112  
Scratchproofing pad (Forest City Products, Inc., 722 Bolivar Rd., Cleveland 15, Ohio)..... 112  
Freezing guide (National Frozen Food Locker Institute, Elizabethtown, Pa.)..... 113  
Pattern marker (Mrs. Berta Nack, 2580 N. Moreland Blvd., Shaker Heights 20, Ohio)..... 113  
Bottle opener (Hartford Co., 955 Asylum Ave., Hartford, Conn.)..... 113  
Translucent awning (Reverso Products Co., 1333 39th St., Brooklyn, N. Y.)..... 113  
Portable electric clothes drier has a variety of uses (Braman Mfg. Co., Inc., 2228 E. Highland, Shawnee, Okla.)..... 117

### INDUSTRY

Precision gauging machine speeds laying of railroad track (Nordberg Mfg. Co., 3073 S. Chase Ave., Milwaukee, Wis.)..... 71  
X rays inspect canned food..... 77  
"Toy" machines aid planning at fountain-pen factory..... 80  
Iraq-to-Paris pipe line for natural gas..... 99  
Abrasive metal cutter won't cut rubber (S. S. White Industrial Div., 10 E. 40th St., New York City 16)..... 124  
Ultrathin steel alloy..... 125  
Wind-tunnel model aids air-pollution studies..... 138  
Mobile power plants serve emergency needs (Caterpillar Tractor Co., Peoria 8, Ill.)..... 139

### LAWN AND GARDEN

Edger-trimmer attachment driven by electric drill..... 99  
Antigrowth-chemical treatment for lawn edges keeps grass short (Loamium Company of America, Harrison, N. J.)..... 116  
Quickly erected flexible-steel pickets make unbreakable fence (Flexifence Co., 801 Plymouth Ave., N., Minneapolis, Minn.)..... 116  
Garden caddy (Bower Mfg. Co., Goshen, Ind.)..... 140  
Sit-down mower (Henry Disston & Sons, Inc., 5032 Tacony, Philadelphia 35, Pa.)..... 140  
Water tender (Luthe Corp., Dept. C-34, 206 W. Washington St., Milwaukee 4, Wis.)..... 140  
Power sprayer (Food Machinery & Chemical Corp., John Bean Div., Grand Rapids, Mich.)..... 140  
Powerful mower (Goodall Mfg. Corp., 401 St. Anthony Blvd., Minneapolis, Minn.)..... 141  
Aluminum trellis (Old Copper Mine Farms, Inc., R.D. 2, Box 198, Plainfield, N. J.)..... 141  
Power edger (Edgit, 1480 N.E. 130th St., North Miami, Fla.)..... 141  
Fertilizer spreader (Roll-On Corp., Dept. X, Box 242, Azusa, Calif.)..... 141  
Two-nozzle sprinkler (Elkay Mfg. Co., 1401 West 8th St., Los Angeles 17, Calif.)..... 141  
Cultivator..... 142  
Mulching mower (Sensation Mower, Inc., Ralston, Neb.)..... 142  
Big-wheel mower (Yetter Mfg. Co., Colchester, Ill.)..... 142  
Garden tractor (Food Machinery & Chemical Corp., Bolens Products Div., Port Washington, Wis.)..... 142  
Reel attachment (Jari Products Inc., 2938 Pillsbury Ave., Minneapolis, Minn.)..... 143  
Yard power (Simplicity Mfg. Co., Port Washington, Wis.)..... 143  
Triple-tube sprinkler (Industrial Synthetics Corp., Garwood, N. J.)..... 143  
Electric mower (Huffman Mfg. Co., Dayton 1, Ohio)..... 143  
Fog generator (Kileze Co., Inc., York, S. C.)..... 143

### MILITARY AND NAVAL

Army water conditioner mounted on truck..... 71  
Bazooka battery..... 71  
Develop automatic high-altitude suit..... 114  
Mechanical wire splicer cuts exposure to enemy fire (Aircraft-Marine Products, Inc., Harrisburg, Pa.)..... 115  
Army stratosphere chamber tests weather equipment (York Refrigeration Corp., York, Pa.)..... 124  
Dual air and hydraulic brake for 97-ton amphibian (Federal Fawick Corp., 5780 Federal Ave., Detroit 9, Mich.)..... 144

(Continued to page 14)





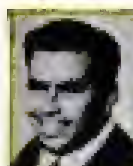
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(Continued from page 12)

## PHOTOGRAPHY

Miniature television camera connects directly to receiver (Allen B. DuMont Laboratories, Inc., 750 Bloomfield Ave., Clifton, N. J.).....105  
Rapid-sequence camera takes big pictures.....144  
Develop three-dimensional X-ray motion pictures.....244  
Rocket camera snaps sun from 50-mile altitude.....246

## RECREATION

Portable swimming pool can be erected in 30 minutes.....70  
Two-piece plastic speedboat requires minimum of upkeep.....86  
Portable beach pen keeps children safe while parents swim.....86  
Aluminum sports trailer sleeps four persons (Sportrailer Mfg. Co., Stephenson Bldg., Detroit 2, Mich.).....114  
Watch tells sportsmen best times for fishing and hunting.....124  
French nautical bicycle permits cycling in the Seine.....125  
Wheeled launching platform trains water skiers.....125  
Telescoping trailer cabin.....145  
Waterproof belt for fish lures (Riverside Mfg. Co., Woodstock, Va.).....228  
Stationary line guide permits easy casting (Ocean City Mfg. Co., 3850 Coral St., Philadelphia 24, Pa.).....228

## MISCELLANEOUS

Tie conceals tiny microphone of miniature recording device.....70  
Carbon ink letters glass.....77  
Commander Sigleer's private fleet.....78  
Fluoroscope view of X-ray is bright enough for TV.....80  
German "kangaroo" rescue ship.....81  
Lightweight shield protects fire fighters.....86  
Plastic toothless "Zipper" makes watertight closure.....92  
Retractable launching pod gives Sabre Jet a 24-rocket "punch".....99  
Ceramic brakes for aircraft.....99  
Chicago builds a three-story underground garage.....100  
Sponge-rubber sanding pad speeds boat finishing (Carborundum Co., Merchandising Div., Niagara Falls, N. Y.).....105  
Postman gets a lift with experimental three-wheel motorcycle.....115  
Homemade lift eases wheel-chair patient into or out of car.....116  
Army "duck" fights fires ashore and in harbor.....123  
U-boat detectors track whales.....125  
Robot records trains.....131  
Sweden works underground.....132  
Model oil rig demonstrates drilling techniques for students.....138  
Ditcher-terracer blade on farm tractors adjusts to many positions (Armor Farm Implement Co., Box 785, Vancouver, Wash.).....144  
College for plumbers.....146  
Inventors hit television jackpot.....148  
Lightweight engine does big job (Food Machinery & Chemical Corp., Bolens Products Div., Port Washington, Wis.).....226  
Propeller-driven tricycle.....232  
Reinforcing corner mesh snaps into position.....232

## Craftsman and Shop Notes Index

### AUTOMOTIVE

Apron secures seat cushion.....176  
Locating oil or gasoline leaks.....196  
Pork-lift truck used for automobile parking lot.....201  
Rewired car heater operates only when generator is charging.....201  
Pulley hub fitted with washer to stop front-end oil leaks.....207

### DRAWING TIPS

Matchboxes provide "cabinet" to hold artist's supplies.....166  
Hand rest for sign painter improvised from T-square.....196  
Tape tab on end of T-square permits tacking to board.....206

### FARMING

Faucet drains into hole in ground.....170  
Handy self-locking post puller made from flat steel.....206  
Mobile water tank simplifies filling of stock waterer.....207  
Feed lot back scratcher from old tractor tire.....210

### FISHING

Popping plug attracts fish.....157  
Aluminum foil lines camping pans.....166  
Fish kept fresh in carton lined with aluminum foil.....176  
Fishline repaired with nail polish.....184

### HOUSE AND HOME

Hardware cloth on screen door reinforces lower section.....157  
Solving home problems.....164  
Cleaning plastic wall tile.....170  
Cement for patching concrete.....171  
Weather-resistant mailbox post made from welded pipe lengths.....184

### LAWN AND GARDEN

Tall flowers protected in wind.....183  
Grass seeder made from can assures even distribution.....166  
Collar from strip of fencing provides tree guard.....170  
Wooden basket serves many uses in garden.....181  
Beach umbrella supports tray that holds small articles.....185  
Tomato spoilage prevented by improvised racks.....201

### NOVELTIES AND GAMES

Making plastic money clip.....157  
Scorekeeper for horseshoe court.....166  
Personalized switch plates.....171

(Continued to page 16)



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(Continued from page 14)

### OFFICE, SHOP AND STORE

Wallpaper rolls tied easily when placed on inverted stool.....	166
Wire replaces standard fuse for experimental work.....	184
Glue cup has disposable liner.....	185
Eyelet-type envelopes used to separate tiny parts.....	185
Portable welding stand used outside of shop.....	196
Repairing stuffing-gland seat on steam-engine cylinders.....	201
Folded slip keeps sheet aligned for insertion in typewriter.....	206
Vacuum-gauge connectors kept at hand in shop.....	207
Improvised paper hold-down.....	210
Wooden ring supports brush in cutting-oil can.....	210

### PAINTING

Concrete floor acid-etched to prepare for painting.....	163
Book-end "feet" for paint can helps prevent upsetting.....	176
Tube fitted over brush ferrule adjusts spread of bristles.....	181
Interchangeable jars for spray gun hold variety of colors.....	202
Painting hot surfaces.....	210

### PHOTOGRAPHY

Storing print tongs.....	191
Camera turned on pan head to shoot unusual angles.....	191
Improvised reflector stand.....	191
Tape anchors printing paper for borderless enlargements.....	191

### TOOLS

Collet for 4-jaw chuck.....	202
Chain-saw conversion unit (Surgi Mfg. Co., 206 Joplin St., Joplin, Mo.).....	208
Beveled sanding disk (Maynard D. Lee, 100 Chestnut Hill Drive, Rochester, N. Y.).....	208
Soft vise jaws (Magne-Grip Tool Co., 4900 W. Madison St., Chicago 44).....	208
Two-way drill guide (Roy Silver Corp., 561 Bridgeport Ave., Devon, Conn.).....	208
12-point spline (12-Point Fastener Corp., 741 Hanna Bldg., Cleveland 15, Ohio).....	209
Rubber molds (Buffalo Products, Inc., 304 Washington Loan & Trust Bldg., Washington 4, D. C.).....	209
Pencil-size soldering iron (Lenk Mfg. Co., 30 Cummington St., Boston 15, Mass.).....	209
V-belt dressing (Sling-Surface Co., 1048 Niagara St., Buffalo 13, N. Y.).....	209
Resistance-type soldering unit (Sunrise Products Co., Box 173, Hawthorne, N. J.).....	209
Lathe center drives small work.....	210

### WOODWORKING

Cart for your outboard motor.....	167
Plan of the month—porch swing.....	168
Rolling shop cabinet.....	195

### WORKSHOP HINTS

Tape wrapped around tubing prevents kinking when bent.....	157
Magnet tests genuineness of brass hardware.....	157
Improvised drill bit.....	166
Straightening small-gauge wire.....	170
Platiron preheats large work for soldering with small iron.....	170
Rubber hose on setscrew wrench provides cushioned handle.....	170
Solder melted more quickly if flattened beforehand.....	185
Teeth filed on back edge of saw blade used for cutting nails.....	186
Thin work chucked to run true on metal lathe by drill pad.....	196
Paper cup serves as jig when soldering wire.....	206
Tobin bronze used for brazing extensions on drills.....	207

### MISCELLANEOUS

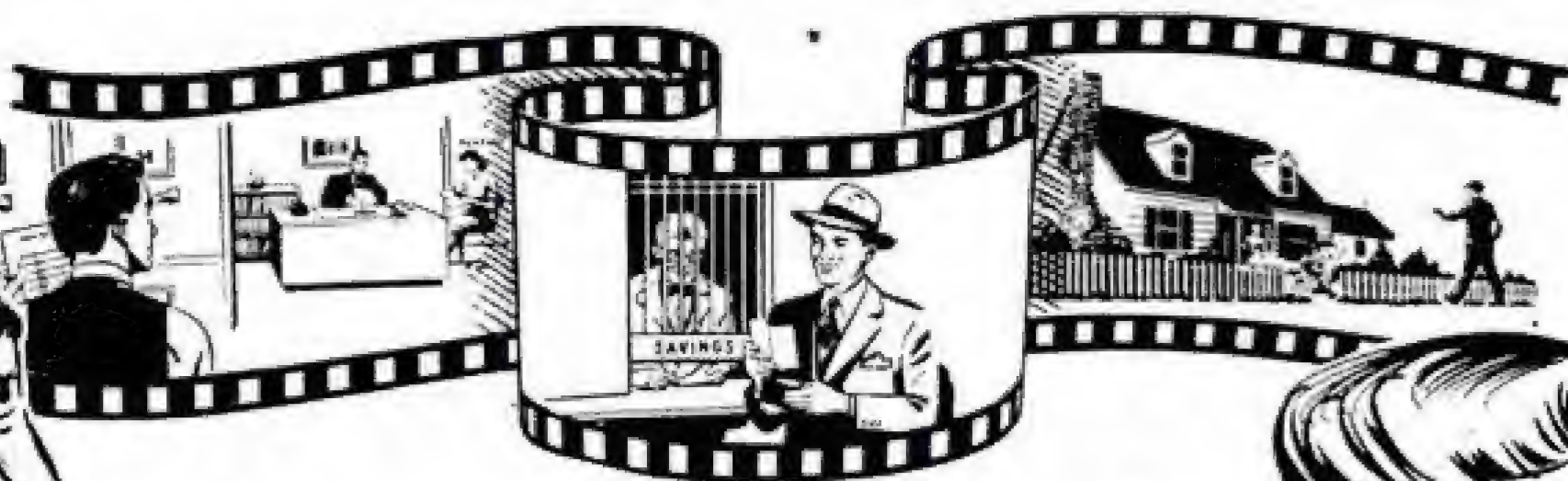
Removing blisters from veneers.....	157
Nylon bristle on tone arm cleans phonograph record.....	176
Picket fencing used as ramp when beaching small boat.....	176
Both liquid and wax polishes used for better shoeshine.....	181
Underseat rack for folding chair.....	185
Three-in-one flagstone mold.....	186
Carry combination square in toy-gun holster.....	196
Ice lowers heavy equipment.....	196
Potato peeler strips insulation.....	202
Hole in screwdriver blade aids in forming wire eyes.....	206
Dust cloth knotted at corner for tucking into rule pocket.....	206
Testing sand for impurities.....	210

## Radio-Television, Electronics

Electronic computer (General Electric Co., Electronics Park, Syracuse, N. Y.).....	211
Miniature transistor hearing aids (Malco Company, Inc., 401 WCCO Bldg., Minneapolis, Minn.).....	211
TV signal booster features "golden grid" tube.....	212
Tiny radio receiver for motor scooter.....	215
Handi Micro-Talkie transmitter (Motorola Inc., 4545 W. Augusta Blvd., Chicago 51).....	215
Learn by listening code records (Raybrun Co., Box 66, Orangeburg, N. Y.).....	215
Selective signaling system (Motorola Inc., 4545 W. Augusta Blvd., Chicago 51).....	215
Radio has plated circuit (Motorola Inc., 4545 W. Augusta Blvd., Chicago 51).....	215
Self-helps for TV-set owners.....	216

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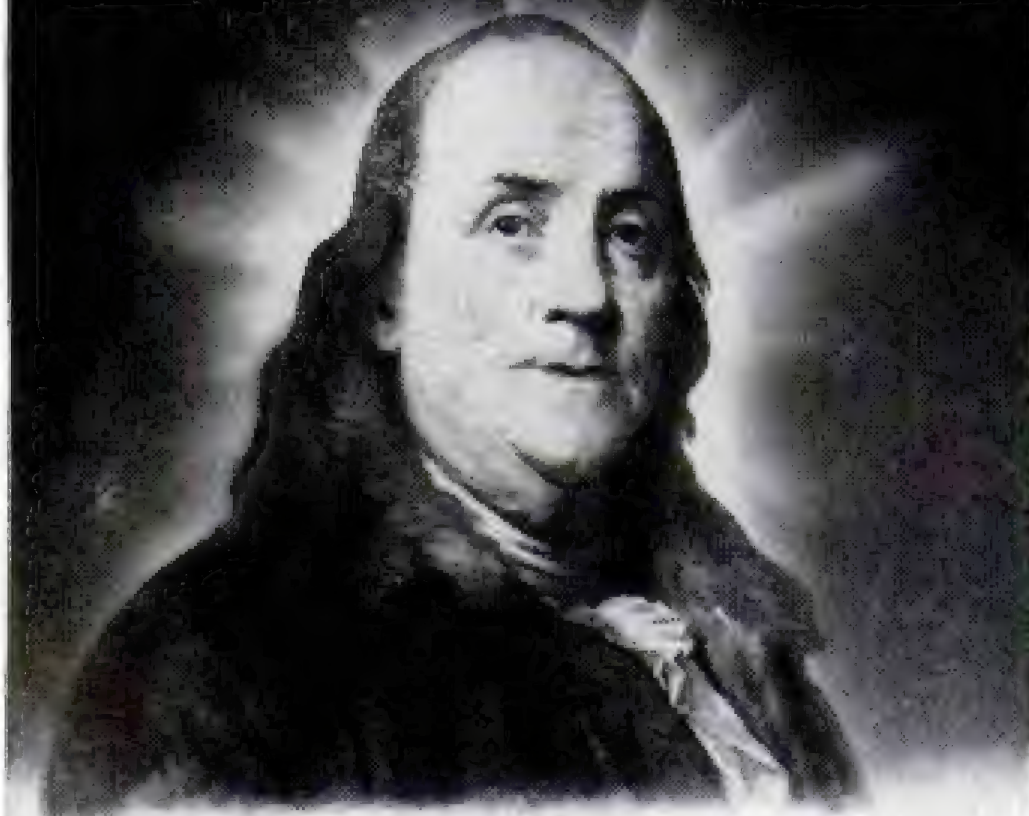
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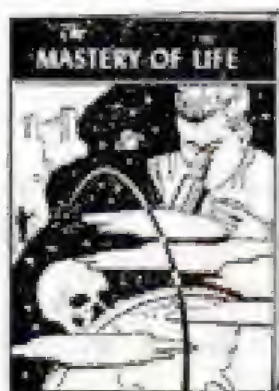


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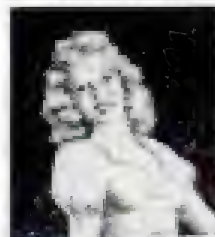
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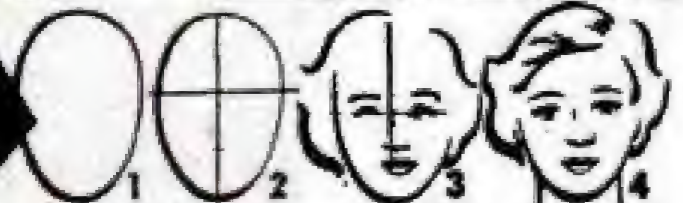
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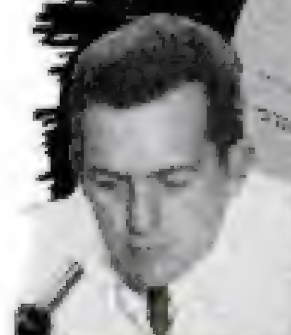
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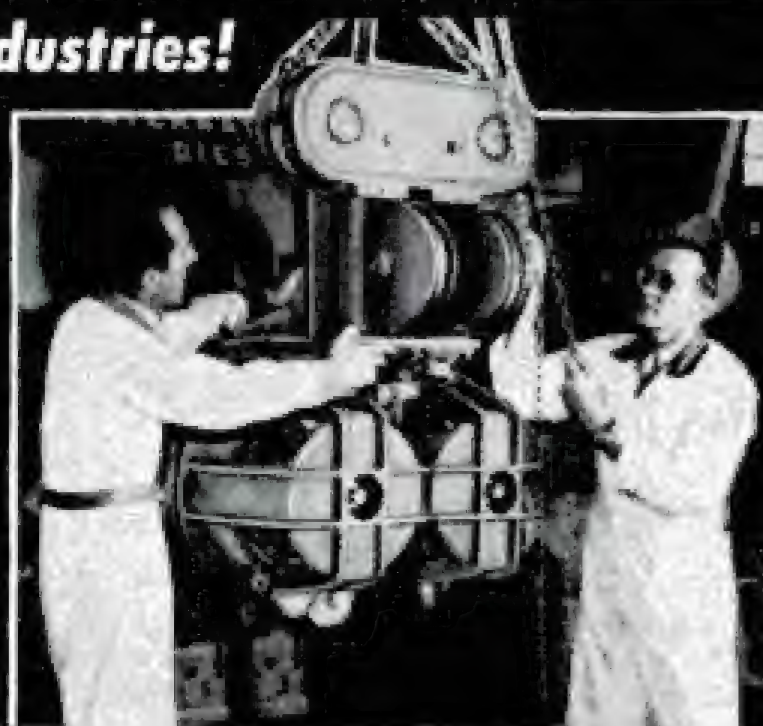


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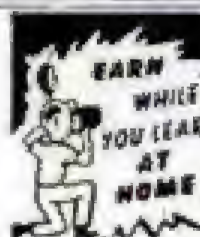
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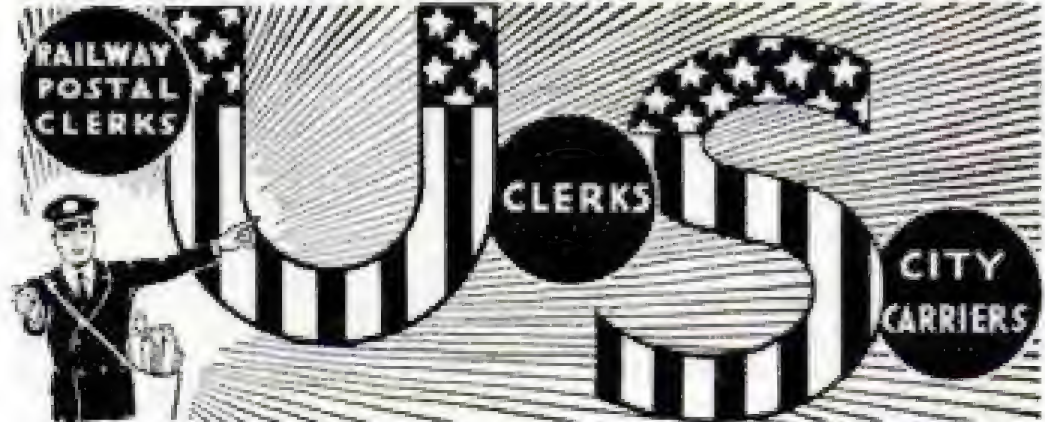
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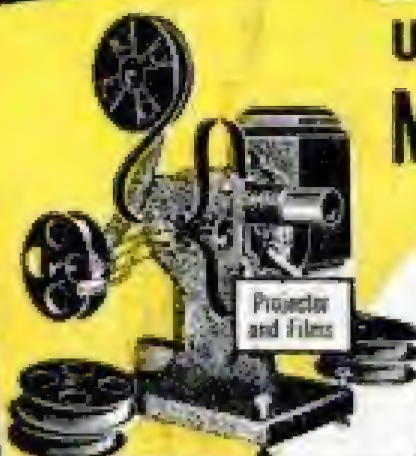


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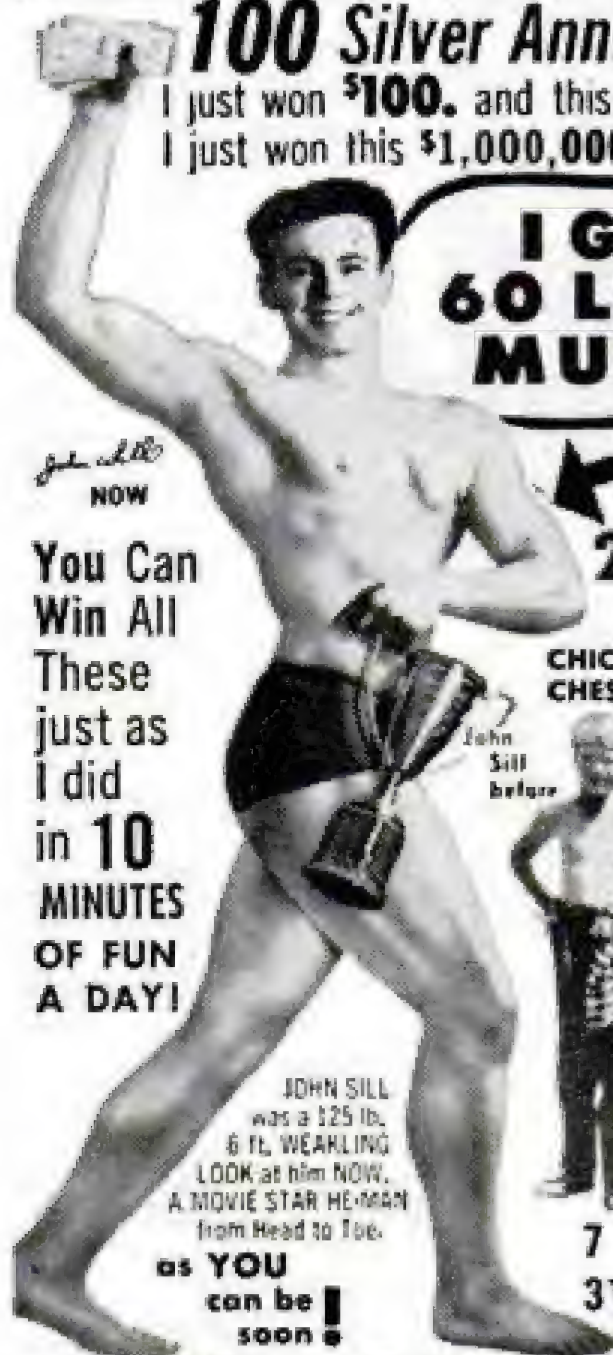


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700-16	6.42	760-15	6.02	750-15	13.92	900-20	17.22
750-16	9.22	800-15	6.52	825-15	12.92	1000-20	17.72
525-18	4.72	820-15	6.62	800-20	8.72	1100-20	19.52
550-17	4.72	670-16	6.32	650-20	10.22	1000-22	19.42
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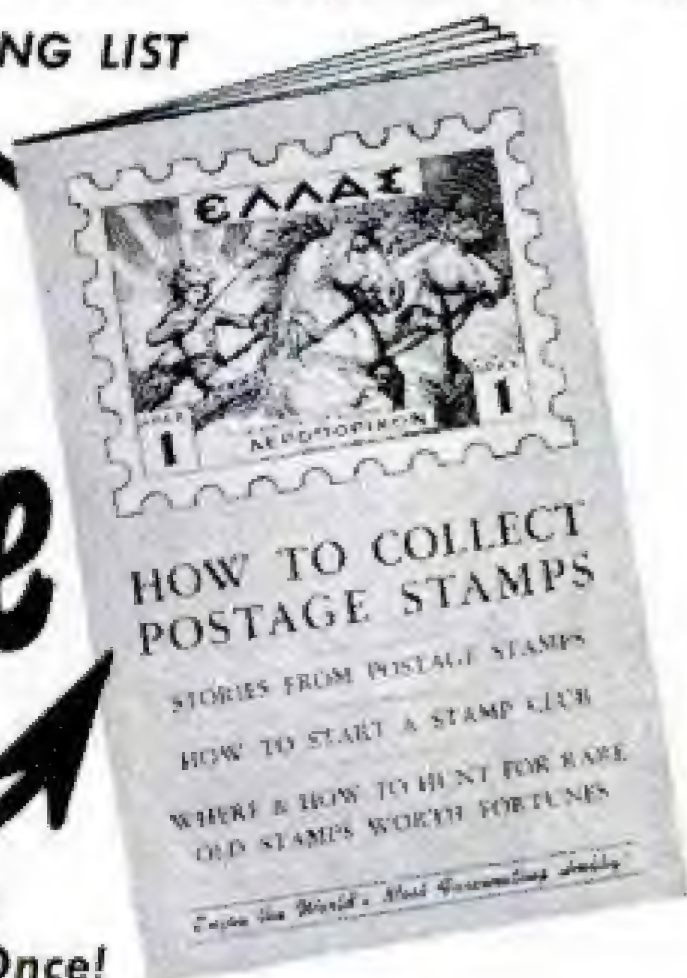
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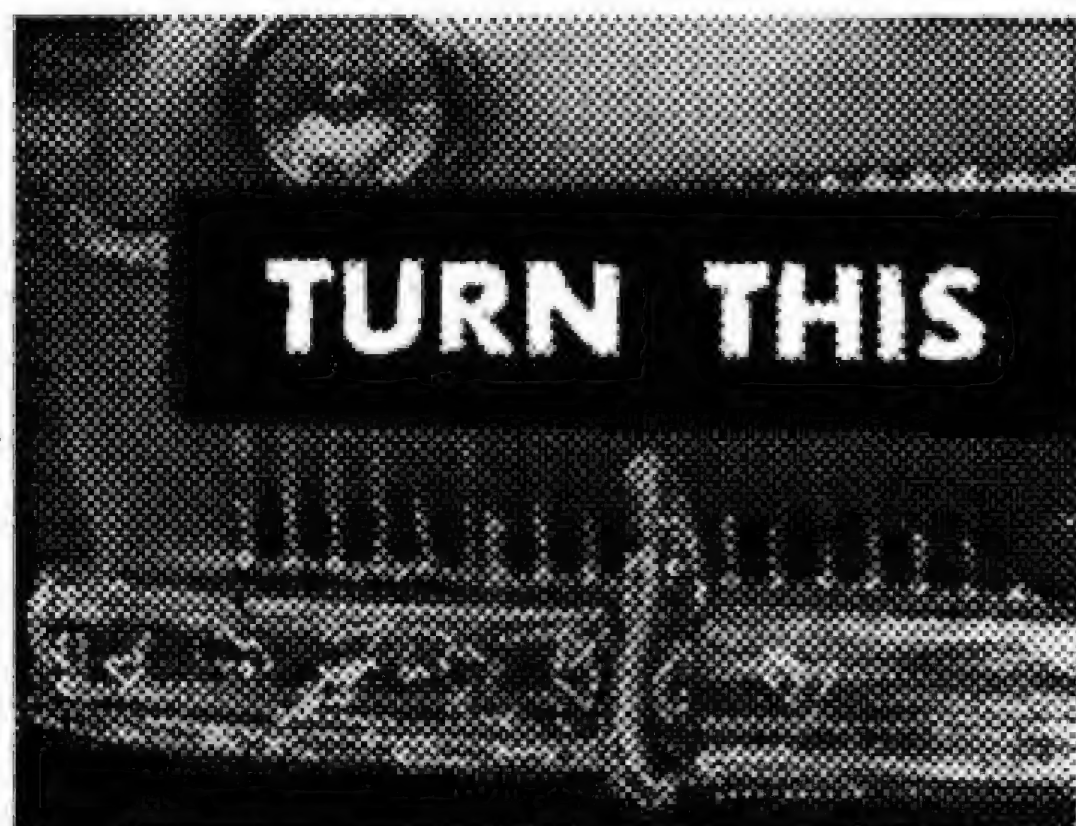
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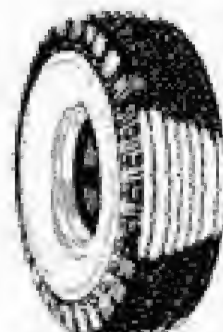
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The month, date, weekday, hour, minute and this Swiss engineering triumph! An impressive, very thin timepiece of real excellence! **Date Changes Automatically!** Gears are precision coupled. Patented design and quality metals make for smooth long-life operation. **SPECIAL QUALITY FEATURES**  
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Compare with other calendar watches selling for \$59.50, and if you are not thrilled with its performance and rich, modern appearance, return for full price refund! While they last, we're sacrificing them at only \$14.95, plus \$1.50 tax, a total of only **\$16.45**. Where, oh where can you get a value like this? Better rush that Coupon now! Order by number 243-C.



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- ☐ No. 243-C CALENDAR—\$16.45

You are to refund **FULL PURCHASE PRICE** if I am not delighted, keeping the "Klarovis" as your gift to me.

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ADDRESS \_\_\_\_\_  
TOWN \_\_\_\_\_ STATE \_\_\_\_\_

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**Break the Chains that Bind you . . .**  
**MAIL THIS TODAY!**



## SPEECH CHART

Name in full.....

Street or R.F.D.....

City..... State.....

Occupation..... Telephone Number.....

1. Age.....Date and year of birth.....	9. Do you stammer while reading aloud when alone?.....	16. At times is it impossible for you to utter a sound?.....
2. Nationality.....	10. Do you stammer while talking in the dark?.....	17. What sounds give you the most difficulty?.....
3. Weight.....Height..... Married?.....	11. Do you stammer when whispering?.....	18. Are you of a nervous disposition?.....
4. At what age did you begin to stammer?.....	12. Do you stammer when singing?.....	19. Have you any physical deformity?..... If so, describe.....
5. What in your opinion was the cause of your stammering?.....	13. When you do not stammer can you speak your words distinctly?.....	20. State the condition of your general health.....
6. Have you any organic defect in the organs of speech?.....	14. At times do you hesitate and stick and are you unable to start to talk?.....	21. How far did you go in school?..... Average grades?.....
7. Does your impediment increase when you are angry?.....	15. Do you repeat one syllable or word before the following one can be uttered?.....	22. Describe further details of your stammering on another sheet.
8. At times do you talk better than at other times?.....		

Form 4



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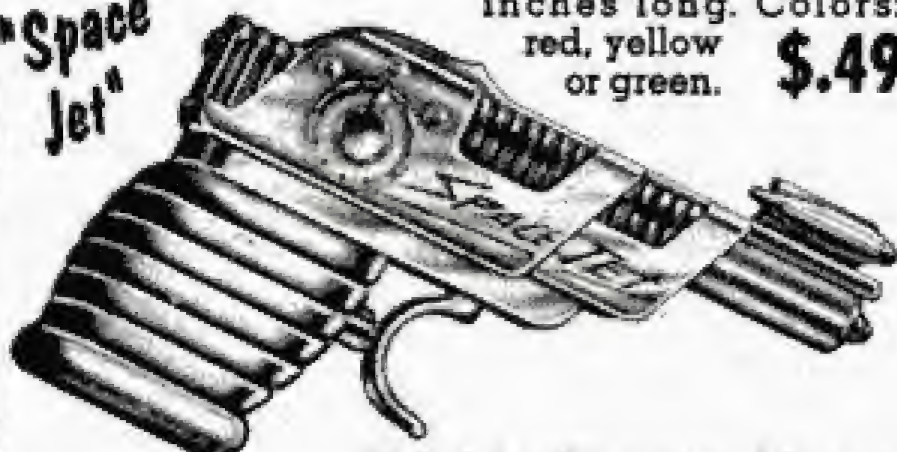
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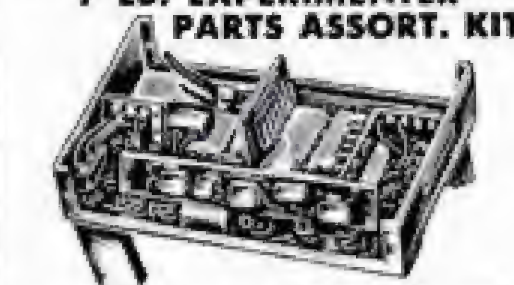
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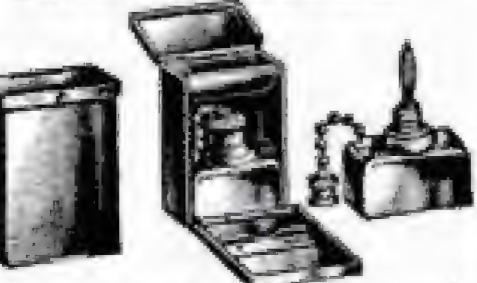
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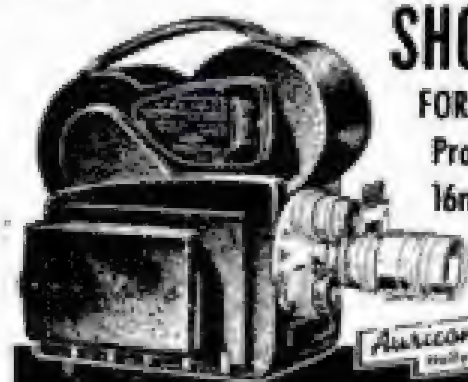
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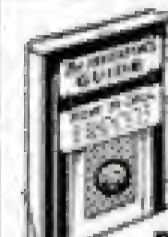
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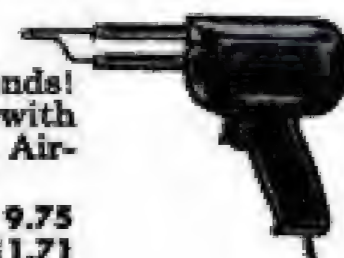
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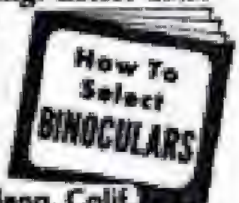
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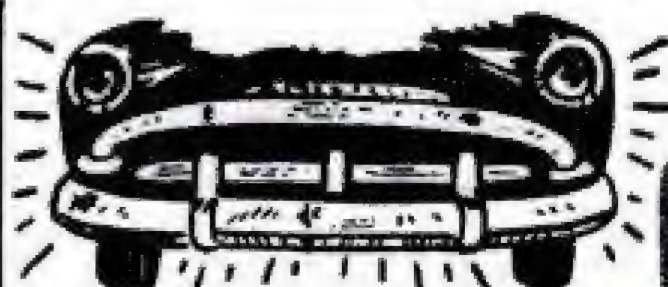
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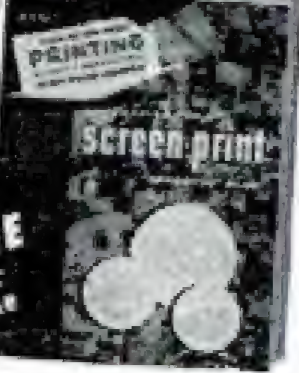
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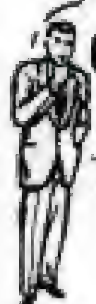
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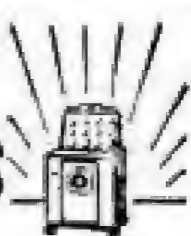


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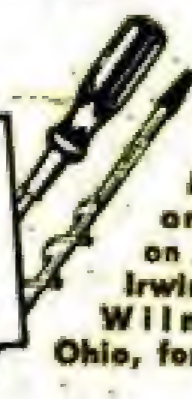
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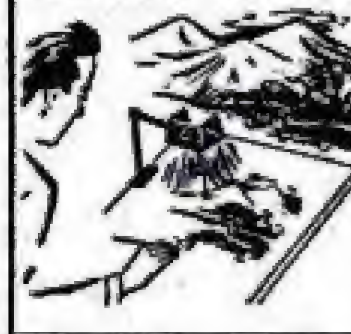
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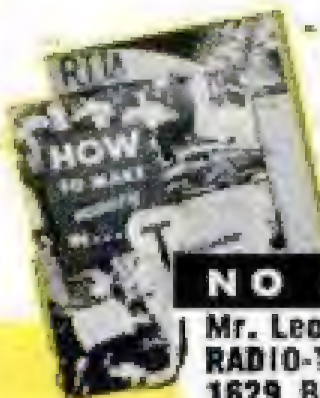
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**GEM Cutting equipment.** Books, The Art of Gem Cutting, \$2.00. Jewelry You Can Make, jewelry designs, \$2.75 postpaid U.S. Catalog 25c. R & B Art-Craft, 11019B S. Vermont, Los Angeles 44, Calif.

**DIAGEMS.** Newest and hardest synthetic jewels. Brilliant blue-white, all diamond shapes, 1/2 to 5 carats for your setting. \$12.00 carat (tax incl.). Free catalog. Diagems, Hampton Bays 7J, Long Island.

**COLOR Agates permanently; red, yellow, blue, green, black.** Instructions \$1.00. Herrmann, Box 146, Seaside, Oregon.



**GEMSTONES.** Mineral specimens. Every variety. Lowest prices. Postcard brings free booklet. Plummer's, 4720 Point Loma Ave., San Diego 7, Calif.

**GEMS.** Precious and semi-precious, genuine, from world-wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., 5450-G Portland Rd., Salem, Oregon.

**FIND Tungsten, mercury, uranium with Mineralight.** Free brochure. Write Dept. PM8 Ultra-Violet Products, South Pasadena, California.

**GEMS And minerals, beautiful magazine tells how to cut and collect.** Brochure and book list free. Gembook Co., Palmdale, Calif.

## ANTIQUES, RELICS, INDIAN GOODS, CURIOS

4 PERFECT Arrowheads \$1.00. Good grooved tomahawks \$2.00. List free. Lear's, Glenwood, Arkansas.

**ANTIQUE, Firearms, pistols, percussion, flintlock, list 25c coin.** Westbrook, 738 Royal Street, New Orleans 16, La.

4 PERFECT Arrowheads \$1.00. Flint knife 50c. Hide scraper 50c. Stone axe \$3.00. Perfect pipe \$3.00. Flint hoe \$1.00. List 10c. H. Daniel, Lamar, Arkansas.

## HOBBIES AND COLLECTIONS

**MATCHBOOK** Cover album holds 240 standard size without paste or stickers. Gay looseleaf binder illustrates matchbooks in colors. New master album \$3.25 postpaid. Matchless Album Co., Box 121PM, Long Branch, New Jersey.

**NAZI, Soviet, campaign ribbons.** Big packet, lists, \$1.00. Medcrafts, 1923 34th St. S.W., Calgary 2, Canada.

**WANTED—Cigarette, tobacco cards.** Write Charles Bray, East Bangor, Penna.

**COLLECT** Tourist pennants or decals, 10 different city or state \$1.00. Green, BD1, 6785 Imperial Ave., San Diego 14, Calif.

50 DIFFERENT Army embroidered patches \$1. Other bargains. Insignia Mart, 703A Broadway, New York 3, N. Y.

**LEATHERCRAFT** Is fun especially now. Make your own leather belts, billfolds, purses, hats, dresses, blouses from durable low-priced leathers. Supplement your seasonal wardrobe with leather articles. Free catalog. Tandy Leather, Box 397-C, Tulsa, Oklahoma.

**EXCITING** Hobby: collect authentic military patches, insignias, campaign ribbons, navy rates, etc. 57 assorted \$1.00. Free gift. Pritt, Dept. M-6, 12 West 27th, New York City.

**CIGAR** Store Indians. Reproductions made to order. Peter Meindl, Raymond, N. H.

**UNUSED** Matchbook covers—100 different \$1.00 38-page catalog 25c. Charles Edelman, 1311C East 84, Cleveland 3, Ohio.

**INVENTING** Can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 40-E 631-E St. N.W., Washington 4, D. C.

## CAMERAS, PHOTO SUPPLIES

**ARGUS C-3** \$51.75. New, Brownie movie camera \$30.75. Other terrific savings. Free catalog. Camera Shoppe, Box 601-M, Mount Vernon, New York.

20 TO 40% Discount. Cameras, projectors, recorders, everything photographic. Send us your needs. Dart Sales, 3812 Atlantic Ave., Brooklyn 24, N. Y.

**SEND \$1.00** For mammoth 275-page illustrated catalog. Dollar refunded with first order. Bloom's Photo Supply, 1657 Main, Springfield, Mass.

**MINIATURE** Album holds twelve 3 1/4 x 4 1/4 snaps in transparent pockets. Three albums postpaid \$1.00. Matchless Album, Long Branch, New Jersey.

**EARN** Money selling cameras. Send for free dealers bulletin. University Camera Exchange, 11-C Waverly Place, New York 3, N. Y.

**FILMS.** Surplus, excellent results: 35 mm, 4 rolls \$1.00. 116, 6 rolls \$1.00 postpaid. MDW Films, G.P.O. Box 1459, New York City.

**BUY** Wholesale nationally advertised cameras, photo supplies, thousands other products at big discount. Free "wholesale plan." American Buyers', 629-RR Linden, Buffalo 16, N. Y.

**BASS** Says: Trading since 1910. Used but good as new buys: 8mm. B.&H. Sportster \$52.50; 16mm. Keystone A-7, F.2.5 lens \$37.50; Voigt. 35mm. Vito II, flash shutter, Skopar F:3.5, like new \$38.50; Kodak Reflex F:3.5 lens, like new \$88.50; Contax I, F:2.8 Sonnar \$87.50; 3 1/4 x 4 1/4 Speed Graphic, Skopar F:4.5, Ibsor shutter, \$52.50. Satisfaction guaranteed. Bass Camera Co., Dept. AG, 179 W. Madison St., Chicago 2.

**IMPORTED 35MM.** cameras with leather case, 3.5 lens, 50mm. coated \$69 value. Sample \$25.50. Write for quantity prices. Bleier, 1022 Main, Neenah, Wis.

**NEW** Cameras! Loaded with film. \$2.00 postpaid. Wallace Jewelry, 3763 S. Wabash, Chicago 15, Ill.

## PHOTO FINISHING

**JUMBO** Size deckle edge prints in album, 8 exposure 35c, 12 exposure 50c. Send money, free mailers. Photoprint, Box 906, Enid, Okla.

**TWO** Beautiful prints from each picture on 8 exposure roll 35c. Thirty-one years of satisfied customers. Quick service. Lens Photos, Dept. J-4, Janesville, Wis.

**OVERSIZE** Prints no extra charge. 8-exposure roll, 30c, 12-exposure, 45c. 16-exposure, 55c. Reprints oversize 4c. Finest quality. Mail Order Photo Service, Box 297, Watertown, Wisconsin.

**FREE** Mailers. 8 contacts 30c, jumbos—40c. 12—45c. Jumbos 55c, reprints—4c. Jumbos—5c. Western Photo, Dept. PM63, Box 298, San Francisco 1, Calif.

**8 EXPOSURE** Roll 25c; reprints 3c. Fast service. The Photo Nook, Box 2134, Billings, Montana.

**BEAUTIFUL** Enlargement from each picture on 8 exposure roll 35c. Cut Rate Photos, Dept. B-4, Janesville, Wis.

**THE** Photo Mill. Immediate service. No delay. Eight exposure roll developed and two prints from each negative—40c; or eight jumbo prints 38c. Single reprints 3c each; jumbo reprints 4c each. Write for complete price list and roll film mailers. The Photo Mill, Dept. K, 1511 Hennepin, Minneapolis, Minn.

**DOUBLE** Size prints—8 exposure roll 30c; 12, 45c; 16, 55c. Prompt service. Free mailers. Emerson Photo, Emerson, N. J.

**TWO** Prints each good negative. 8 exp. 35c; 12 exp. 50c; 16 exp. 65c. Reprints 4c. Mayfair Photo Service, Box 617-K, Toledo, Ohio.

**SATISFACTION** Guaranteed! Eight jumbo size prints mounted in album. 35c—12 to 16 exposure rolls, 50c. Free mailers, quick service, finest developing, finishing. Crown Studios, Box 1223-PM, Dallas, Texas.

**12 JUMBOS** 25c, 16 Jumbos 35c, from any size roll or negatives, with this ad. Skrudland S, Lake Geneva, Wis.

**ENLARGEMENTS!** Eight 5 x 7s or five 8 x 10's, \$1.00. Wilart Enlargers, Box 987, Little Rock, Ark.

**CUSTOM** Photo finishing guaranteed. 8 exposures 35c; 12, 50c. Bound in beautiful plastic ringed album. Special! 35mm., 36 exposure \$1.00. Free mailer. Flash Foto, Box 36M, Brooklyn 4, N. Y.

**FAST**—Same day service! 8 oversized prints in attractive plastic-bound book only 35c; 12—50c; 16—60c. Satisfaction guaranteed. Free exposure guide with first order. Pic-Sure, Box 899-B, Philadelphia 5, Penna.

**6 OR 8** Picture roll 35c, 12 or 18 picture roll 55c. Each roll printed and developed. Handy album pack. If you fail to get pictures on your film a new roll will be sent you without extra cost. Send coin with roll. No c.o.d.'s. Mailing containers sent free. DeLuxe Film Service, Box 1268-A, Shreveport, Louisiana.

**TOP** Quality. Fast service. 8 jumbos 35c in beautiful Super Pak Album. 16 contacts 40c. Reprints—Jumbos 4c; contacts 3c. Satisfaction guaranteed. Write for free mailers and circulars. Fast-X-Photo, Box A, Jersey City, N. J.

**GUARANTEED** Quality. Fast service. Eight jumbos in beautiful super pak plastic ring binder albums only 35c. Send for free mailers and particulars of our complete photo finishing service. Grand Fotos, G.P.O. Box 1410, New York 1, N. Y.

## MOTION PICTURES AND SOUND EQUIPMENT

**8MM** And 16mm home movies of beautiful national parks in Kodachrome, free list. Ideal Service Supply, 2101 Barclay, Oklahoma City 14, Oklahoma.

**EARN** Up to \$15.00 daily with your movie projector! Metcalf, 10806 Glenroy, Chicago 43.

**WILD** Life films. Exciting, dramatic action in the natural habitat of animals of forest and plain. 8mm. or 16mm. in beautiful color or B & W. Also 2" x 2" color slides. Write for free illustrated literature. Wild Life Films, 5151AF Strohm Ave., North Hollywood, California.

**5000** NEW—Used 8-16mm. silent-sound films. International-B, 2120 Strauss, Brooklyn 12.

**BARGAINS** 16MM. sound films. Also for exchange. Bedner, 5300 So. Talman, Chicago.

**RENT** 16MM. sound films, 50c reel. Large selection; free catalog. Film Service, 128 Chestnut St., Roselle Park, N. J.

**MOVIE** Camera film: 8mm. roll \$1.50, 16mm. 100' \$3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

**GUARANTEED** Fresh 8mm. roll, magazine; 16mm. roll, magazine movie films. Color, b&w. Free catalog. ESO-S, 47th Holly, Kansas City 2, Missouri.

**TAPE** Recorders, tapes, accessories. Unusual values. Dressner, 624-M East 20th Street, New York City 9.

**"ENTIRE** Life Story of Christ." 8mm., 16mm., sound and silent, purchase or rent, state projector. Hemenway Film, 31P Church St., Boston 16, Mass.

**BELL & Howell** 16mm. sound projectors. Castle sound films, splicers, reels, other supplies. Free catalog. Ideal Service Supply, 2101-PM Barclay, Oklahoma City 14, Okla.

## MUSIC AND MUSICAL INSTRUMENTS

**POEMS** Wanted for musical setting. Send poems. Free examination. Crown Music Company, 1476 Broadway, New York City 36.

**POEMS** Wanted for musical setting. Send poems for free examination. Five Star Music Masters, 630 Beacon Bldg., Boston, Mass.

**PLAY** Musical saw for pleasure, profit, popularity. Professional musical saw, hammer, saw bag, instructions, \$9.95 postpaid U.S.A. Robert Celaya, Brownsville, Texas.

**WORLD'S** Best offer to song writers. Send 25c coin. E-Z, 1133 Broadway, New York 10.

**SONGWRITERS!** Protect your ideas! Hold all songs, poems! Write for safe correct procedure first! Song Service, Dept. P, 333 W. 56th St., New York 19, N. Y.

**MUSIC** Arranged, songs printed. Frank Wildt, Music Publisher, Lancaster, Penna.

**ACCORDIONS**—Save 50% and up. Cash or terms. New and used. All brands. Wholesale to everyone. Free catalogue. Del Principe, 29 South Cicero, Chicago 44, Ill.

**POPULAR** Songs. How to write and sell them. Write for free booklet Successful Songwriting. Gateway Songs, Box 2470, Hollywood 28, Calif.

**SONGWRITERS!** Send poems, songs. Music Service, 243 West 72nd St., PM, New York 23.

**POEMS** Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PM S. Alexandria, Los Angeles, California.

**WANTED!** Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

**WRITE** Songs. Big money and reputation. Write for information. J. Gordon Pub. Co., 4700 South California Avenue, Chicago.

**SONGPOEMS** Wanted. Mail to: Tin Pan Alley, Inc., 1650 Broadway, New York 19, N. Y.

**POWERFUL**, Dynamic voice quickly developed with diaphragm exerciser. Write, Voice Developer, Box 665 (34V), St. Louis, Mo.

**POEMS** Wanted for musical setting. Send poem for immediate consideration and free rhyming dictionary. Richard Brothers, 24 Woods Building, Chicago 1.

**1953** ACCORDIONS—Wholesale. Free catalog. American Accordion Center, 5329 Belmont, Chicago.

**ELECTRIC** Guitars, accordions, amplifiers. Wholesale. Free catalog. Carvin, Baldwin Park, Calif.

**FREE** Record of your song. Your words—my melody. Free information. Johnny Mack, 1094-A West 39 Street, Los Angeles 37.



## RADIO AND TELEVISION

**AMAZING** Newly developed, permanently fixed crystal detector with warranty guarantee and complete plans for building crystal radios, only \$1.00 postpaid. Allen, 427-PM10, Clinton, Missouri.

**ANNOUNCING** New circuits for builders. Receivers, experimental computer, brain and control circuits, many others. Many samples, catalog, \$1.00. Money back guarantee. William Bentley, Box 2056, Pensacola, Florida.

**EXPERIMENTER'S** Plans, diagrams, booklets. All kinds. Dittotax, 5208-A Onacrest, Los Angeles 43.

**MAKE** Louder crystal radio. Plans, mounted crystal, catwhisker, 25c. Complete kit \$1.00. Mallory, Box 1031-P, Tacoma, Wash.

**SIMPLE** Radio television trouble analyzer. Do profitable service work. \$1.00 postpaid. Stegotronics, Colchester, Conn.

**ANTENNAS**, Towers, boosters. All makes, complete supplies. Easy credit, lowest prices. Allied, 2503 N. 3rd, Milwaukee, Wis.

**BUILD 15** Radios—Only \$19.95 complete. Free radio tester, tools, soldering iron. No experience required. Enclose 25c for valuable Radio-TV Repair Guide and kit catalog. Progressive Electronics, 497 Union Ave., Dept. PM-6, Brooklyn 11, N. Y.

**REPAIR** Your own radios. Complete simplified instructions only \$1.00. Details free. Slate's Radio Service, Corsicana, Texas.

**CRYSTAL** Operates loudspeaker. Illustrated instructions, 25c. Hulet, R4, Lakewood, N. J.

**ENJOY 3** Color television filter screen now. Changes dull eye straining black-white pictures into beautiful color tones. Seconds to attach. Send \$1.50 for 16" or under; \$2.00 size 17"; \$2.50 size 20"; \$3.00 size 21"; \$4.00 size 24". Money back guarantee. Zingo Products, Johnstown 7, New York.

**USED** Television receivers \$10 up. Price lists, descriptions 30c. Ace Television, Kalamazoo, Michigan.

**15 TESTED** One-tube circuits 25c, including "Radiobuilder," catalog. Laboratories, 1131-C Valota, Redwood City, Calif.

**NEW!** Just out. Simplest capacity operated relay yet! Uses one tube, low power. Complete schematic, instructions \$1.00. Free details. Chemi-Technix Labs, 568RC Riley, Buffalo 8, New York.

**ELECTRONIC** Ear—\$1.00. Obeys spoken commands. Turns lights, radios, etc., on or off. Not a toy. Plans. Mail \$1.00 to Dept. M-1, National Industries, Inc., 951 No. La Cienega, Los Angeles, California.

**"AIR Condition"** your television set! Prevent over-heating, interference, expensive breakdowns. Remove "boxed-up" chassis heat. Complete unit, \$10.00 prepaid. Video Vent, 662 Perkins, Sacramento 18, Calif.

**CLEARCO** Crystal radio kit \$1.50; preassembled \$1.75. Free catalogue. Clearco Crystal Co., Box 1857, Milwaukee, Wis.

**BUILDER'S** Pictorial plans. Free list. Alena, Box 24, Astoria 6, New York.

**AMAZING** Television antenna eliminator. Small device attached to rear of set where it's out of sight. Outperforms outdoor aerials. No snow, no ghosts. Send only \$2.95 or write for free details. Arrow Sales, 2306 S. Howell, Milwaukee 7, Wis.

**PICTURE** Tube revitalizer makes dim pictures bright. \$2.95. T.V., 6225 Market St., Philadelphia.

**CRYSTAL** Radio needs no antenna, ground. Receives while carrying. Ideal on bicycles. Plans \$1.00. Box 6008, Kansas City, Mo.

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**NEWEST** Spare, full-time home business. \$5 to \$10 hour possible. Paint with suede—The finish with touch and eye-appeal. Beautiful auto dashboards, signs, radios, toys, figurines, lamps—1001 others. Complete, step-by-step instructions sent for no-risk examination. Free details. Coast, 1004-HR So. Los Angeles St., Los Angeles 15.

**HAVE** Fun, make money—Learn metal casting at home. You can make anything of metal. Send 10c for first article on metal casting. Literature free. "How To Do It" Co., P.O. Box 124, Lynwood, Calif.

**FOR** Pleasure and profit. Send for free illustrated instruction book and business plan; how to permalize, metalize, ceramize, porcelainize baby shoes, mittens, booties, cloth, lace, etc. No equipment, no firing, no baking. Professional Art Products, Dept. PM-6, 825 South Wabash, Chicago, Illinois.

**ADVERTISING** Book matches—Cash in on big demand; sell union label matches. Cuts for all businesses and political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. MX-653, 7530 Greenwood, Chicago.

**START** Your own business on credit. Your own boss. 1586 of our dealers sold \$5000 to \$27,500 in 1951. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. F-U-PPM, Freeport, Ill.

**IMPORT-Export!** Opportunity, profitable, world-wide, mail-order business from home, without capital; or travel abroad. Established World Trader ships instructions for no-risk examination. Experience unnecessary. Free details. Mellinger 26, Los Angeles 24.

**WANT** A diesel job? New opportunities to increase income. Higher pay. More money. We can help you qualify. Tools. Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division, Interstate Training Service, Dept. B3F, Portland 13, Oregon.

**ARTKOTE** Stone facing molds can help you become independent. Sample mold \$2. Literature free. Dividend Company, Liverpool, N. Y.

**800% PROFIT** With our O.R. mail order plan. Complete plan, ad copy, etc., just 25c. Mann-Sales, 17 William, Hillsdale, New Jersey.

**START** Your own business at home, make extra money spare time taking subscriptions to popular magazines. Liberal commissions and valuable prizes. For details and supplies, write Dept. PM, Home Reading Circle, 25 So. Center St., Springfield, Ohio.

**BOOKKEEPERS**, Increase earnings operating sensational bookkeeping service. C.P.A. system. Kern, 4942 Vineland, North Hollywood, Calif.

**SPECIALIZED** Magazines covering your field of interest help you to greater success. Get latest copies through our easy-to-get-acquainted service. Hundreds of business, trade, professional, educational, sport, hobby, gift, grocery, health, historical, horticulture, hospital, hotel, humor, insurance, jewelry and others covering all interests. Send for list today. It's free. Commercial Engraving Publishing Company, 34C North Ritter, Indianapolis 19, Indiana.

**BE** A jobber without investment, without inventory. Discounts 50% and more—Even on small orders. Draw from \$250,000 stock. Sell stores, individuals. Profits up to 100%. Terrific line of toys, novelties, jewelry. Free catalog. Modern Merchandise, Dept. 36, 169 W. Madison, Chicago 2, Illinois.

**SIDELINE** Salesman, auctioneers, agents. Free wholesale list. Watches \$3.88, jewelry sets \$4.20, also name brands jewelry, merchandise. Everything guaranteed. Casey Hoffer Corp., Dept. 70, 618 Jackson, Chicago 6.

**FREE** Electroplating information. Money making plans. Send postcard for your copy. Highly paid, interesting, uncrowded field. Plater M. Hyde, 327 West 120th Street, Los Angeles 61, California.

**LIQUID** Marble—Colorful, glossy! Molded, brushed, sprayed! Cast novelties, statuary, colored tiles. Flexible molds. Composition floors. Particulars free. Marbleizing Service, Edwardsville, Illinois.

**BIG** Profits weaving rugs—Send 10c for our catalog, sample card, and low prices on carpet warps, rug fillers, looms, parts, inexpensive beam counter. If you have a loom, give make and width please. Or. Rug Company, Dept. 6396, Lima, Ohio.

**HOW** To raise the money you need. Free details. Enterprise Bureau, Syracuse 2-P, N. Y.

**"MAKE** Perfume." Catalogue free. "International," 6347 Parnell-PM-6, Chicago 21, Illinois.

**MAKE** Tough, durable plastic—1c pound. Makes attractive floors, walls, built-ins, roof. Build good home \$150.00 room. Bays Laboratory, Oklahoma City 9.

**START** The ideal small town home business. Floor sander rentals. Little capital required. Pay for machines as you go. Make up to \$5000 operating from your home. Man or woman. Details free. Rader, Box 8456, Kansas City, Missouri.

**MAKE** Products—Sell mailorder formula catalogue free. "Imasco," 6347 Parnell-PM-6, Chicago 21, Illinois.

**FRANCHISES** Make profits! Become exclusive distributor or agency operator. Nationwide opportunities. For immediate action write National Franchise Reports, 452 Pure Oil Building, Chicago 1, Illinois.

**PROFITABLE** Mailorder business! Learn how. Many lines. Catalog 10c. Mann-Sales, 17 William, Hillsdale, New Jersey.

**MAKE** Perfumes at home, write "Carey Laboratories," 1914 Chouteau PM-6, St. Louis 3, Missouri.

**SOIL** Analysis—Fascinating new business, every homeowner a customer. Write Soiltest, 307E Woodland, Lake Bluff, Ill.

**HOW** And where to obtain capital? Free details. Star Service, Wapakoneta, Ohio.

**LEARN** Sewing machine repair, electrify, rent, trade, sell. Make up to \$150 week spare time setup. Motor kits, zigzag machines, etc. wholesale. Free particulars. Taylor Service, Hamilton PM-6, Ohio.

**FLEXIBLE** Rubber moulds for plaster and Marbleite figurines. Sample and large illustrated catalog 25c, refunded on first order. K-C Novelties, Dept. 43, Easthampton, Mass.

**START** Home mailorder business. Details. Gedgard, Box 798-L, New York 1, N. Y.

**MAIL** Order money making information free. Write Buckner, Box 175, Mount Pleasant, Texas.

**WANT** Extra money? Learn to sell by mail. Write: Carlton's, 3007 Wharton, Philadelphia 46, Penna.

**WHOLESALE** Catalog! Over 400 nationally advertised items. 20c. Kennedy's, Dept. 8, 216 "F" Street, Anniston, Ala.

**START** A buying service, buy wholesale thousands nationally advertised products. Make big profits selling at sizable discounts. Postcard brings details. American Buyers, 627-R Linden, Buffalo, N. Y.

**BE** Your own boss pioneering new concrete waterproofing your town. You get material wholesale and also make fine profit on contract jobs. All or part time. Rex Aquadry, 5511 W. North Ave., Chicago 39, Ill.

**QUICK** Sign painting. Use letter patterns, avoid sloppy work, wasted time. Write for sample. John Rahn, A1330 Central, Chicago 51.

**BIG** Mail. Receive thousands of money making opportunities. One listing 25c. Three 50c. Thomas Jerdon, Hermansville, Maryland.

**BIG** Profits making keys, spare or full time. New, inexpensive machine makes these keys. Details free. Starrett Mfg. Co., 3038 Adams Avenue, San Diego 16, Calif.

**BIG** Profits! Raise real Chinchillas on our new lease plan. You raise them, we buy them. Small capital can show terrific profit possibilities. Booklet free. Chinchilla, Dept. 505, 303 Lexington Ave., New York City.

**PROFITABLE** Mailorder plan. Free advertising. Mailing. Small ad brings quarters, half-dollars. Big profits 50c. Rorick, Box 86, Cincinnati 26, Ohio.

**PLASTIC** Engraving, carving machine—"Dupliscafer." Profits to \$5 hour engraving plastics. Details, sample 25c. Desco Distributors, 6334-R Sepulveda, Van Nuys, Calif.

**MAKE** \$6.73 Every time you sell one—And they're amazingly easy to sell! We have new adding machines in original factory cartons you can sell for only \$14.95 and you make 45%. They're executive model portables, precision built with automatic clearance, direct subtraction, fully guaranteed. Send for life size color photo with full details. Write today to Lightning Adding Machine Co., Inc., Dept. P30, 1280 West Second Street, Los Angeles 26, Calif.

**START** Your own thrilling mail-order business, anywhere, on small capital; proven plans. Write Paragon, Box PM-1794, Houston, Texas.

**ADDITIONAL** Income. Want to own a collection agency? Mail \$1 for instructions. Sterling, Great Neck 7, N. Y.

**PROFIT!** Without investment! Through our watch-clock-jewelry repair service. Inquire. Modern Technical Supply, 55-PM-West 42nd Street, New York 36.



**MAKE Money** mailing to sportsmen. Supplies furnished. Details 10c. Zamboni's, Box 1138, Longview 33, Washington.

**WANTED**—Interested person to act for foreign shippers. Learn business. Ezso, 725 Highland Ave., Kenmore 23, New York.

**WANT A new car; fine clothes; more money?** These can be yours! Complete home plans for making-selling many sought after articles, \$1.00 (truly different). No special ability needed. Profit unlimited. Send today! Master Skills, 118-M Ashland Avenue, River Forest, Illinois.

**BUY At genuine wholesale prices** direct from large New Jersey wholesale distributor. Full dealer discount on nationally advertised standard brands of power tools, housewares, bicycles, watches, jewelry, radios, appliances, refrigerators, cameras, auto supplies, sporting goods, musical merchandise, etc. Go into business for yourself—we supply you. Shipment made direct to your customer. Supply your own and friend's needs. Send \$1.00 for set of five different catalogs and wholesale price lists. \$2.00 refund certificate given. If not satisfied this is the best deal you ever had, return everything for full refund. Nobody does, nobody can undersell Passaic Valley Distributors, P.O. Box 1543, Paterson, N.J.

**SELL Perfumed stationery** by mail. Own exciting home business. Renzi Press, 34-R North Seventh, Newark 7, New Jersey.

**EARN Big money** by mail. Depression-proof income. Circular 10 cents. Complete starting deal \$3.00 postpaid. Reho, Box 31A, Whitsett, Penna.

**START Your own business** with a route of nut, candy or gum vendors. No experience necessary. Full or part time. Send for catalog 100. Rake, 609-S Spring Garden St., Philadelphia 23, Penna.

**MAKE Money** selling merchandise by mailing cards. Paton, Box 55-M, New York 23, N. Y.

**BIG Money!** Start your own plastic business at home. Spare or full time. (Also valuable liquid marble information.) Free catalog. Write: Bing Products, PM-853, Watertown 72, Mass.

**BUY 250,000 Articles** wholesale. Directory 25c. Publishers, Box 1486-P6, Detroit 31.

**NO Equipment, big profits** selling, glass, wall, waterless hand cleaner. Add water to concentrates. Donnell Sales Co., P.O. Box 321, San Bernardino, Calif.

**START Your own profitable home mail-order business!** We supply everything! Write today! Studio Products, Box 564-A, Glendale 5, Calif.

**START Profitable lumber, wood products business.** Sell by mail. No investment. Chas. Webster, Guttenberg, Iowa.

**SELL By mail** to automobile owners. Millions of prospects. Fast selling items. Everything furnished. Write: Eastern, Box 142-P, Dorchester 24, Mass.

**FLORIDA Opportunities!** Hundreds of jobs, businesses, farms, groves, ranches, homes. Free details! Florida Opportunity Bulletin, Box 456-N14, Coconut Grove, Miami 33.

**500 RADIO Broadcasting stations,** who advertise on commission basis. Complete list nationwide, \$1.00. Dennett's Products, Box 165-A, Providence 1, R. I.

**PROFITABLE Home business,** manufacturing plaster novelties. Free information. Mertz Plastercrafter, San Bernardino, Calif.

**SELL Popular Mechanics** and all other magazine subscriptions. Free catalog, supplies. Subscription Service Company, Dept. A, P.O. Box 2070, Birmingham, Alabama.

**FREE Booklet** reveals amazing secrets behind 301 new profitable enterprises! Many mailorder! Includes confidential instructions for starting wholesale buying service. Deumant Business Surveys, 79-R Deumant, Kenmore 23, N. Y.

**LET Others sell for you.** Earn steady from home. No mail order. Full set up service from idea to success. Free information. Hermes Company, 152 West 42 Street, New York.

**MAIL Order business** using profitable free advertising method reaching 68½ million. Revealing information free. H. P. Seidel, 7070 Hollywood Blvd., Hollywood 28, California.

**START Business without capital!** Reliance, 15-A, Park Row, New York 38, N.Y.

**NEWSPAPERS.** Turn them into cash. Eighteen methods. Instructions 50c. Charles Company, 12-DBE, Norwood, Ohio.

**PROFIT With garden golf.** Instructions on locating, building, operating. Write Brockway, Seaside, Oregon.

**LIVING Miniature ("Ming") trees** only 10 to 20 inches tall. Grow at home. Big profits! Spare time opportunity. Fascinating! Amazing! Write for free seed and plan. National Nursery, Dept. FC, Inglewood 4, California.

**YOUR Own business** in your basement. Very profitable. Sideline or full time. Patterson, 2518 Beaver, Des Moines 10, Iowa.

**MY Husband, college professor,** devised a scientific mail order plan that brings \$1000 monthly to our mailbox. Since the plan works anywhere, we bought a beautiful ranch, operate here. Anyone intelligent can apply our plan. Details free. Eveningshade Ranch, Helotes, Texas.

**NATURAL Molding latex.** New low prices. Extra thick. Free sample. W. Wooley, 115-A Donald, Peoria, Ill.

**GET Dollars in your mail—Keep every cent.** Orders filled free. Genmerco, Box 142, Boston, 24B, Mass.

**LEARN Silk screen printing;** invisible reweaving; repair dolls; make rubber stamps. Rubber for molds. Large catalogue free. Universal, Box 1076-A, Peoria, Ill.

**\$50 AN Hour** in spare time. Johnson, 351-B, Ithaca, New York.

**HAVE Big time mail business.** Get ideas, help, inspiration from others who made fortunes. Fern, 513-A West 61st, Chicago 21, Illinois.

**BUY It wholesale!** Manufacturers, distributors offer 850,000 items. Literature free. Olsen, 1231-A East Third St., Duluth 5, Minn.

**BREED Rare tropical fish** at home. Earn big money! Learn secrets! Help fill huge demand. Amazing opportunity! Free plan. Tropicals, 1008-F Los Angeles St., Los Angeles 15.

**EXTRA Dollars.** Spinning angora wool for us. Angora House, PM, Springfield, Illinois.

**INCOME** From local information. No selling. Write Neherco, La Verne, Calif.

**BOOKKEEPERS.** Keep books, small firms spare time. Manual latest technique by C.P.A., \$3.00. Modern Business, Box 406, Youngstown 1, Ohio.

**MADE \$24,500** Using money making plans from Schemer Magazine, world's oldest mailorder publication. Box 275M, Canfield, Ohio. Year \$1.00. Sample 20c.

**\$46 FROM Square foot plywood;** jigsaw necessary. Write: Woodarts, X-154, Bridgewater, Mass.

**FREE Particulars "Profitable Home Business Projects"** plus wholesale sources 740,000 items. Cottage Industries, Omaha 12, Nebr.

**FREE Vending machines;** if used to sell our profitable nuts. Continental, Box 1361-A, Milwaukee 1, Wisconsin.

**WHOLESALE** Of sensational nationally advertised appliances, silverware, watches, cameras, etc. Start your own business. Full details. Send 25c for catalogue. International Sales Co., 175 Fifth Ave., New York 10, N. Y.

**EARN Extra money** with profitable home business projects, free particulars. Chamberlain, Box 894, Manchester, New Hampshire.

**PROFITABLE Home business,** electroplating novelties, giftwares, auto parts, mirrors. Easy, inexpensive home processes. Free booklet. Tyco Metals, Box 13231-MJ, Houston 19, Texas.

**COLOR Concrete** with chemicals. Marble-glaze cement benches, pottery, garden ornaments. Home — shop. 10c brings sample, pictures. Hollywood Cementcraft, 8527-R Wonderland, Hollywood 48, Calif.

**MAKE Gifts, novelties, jewelry,** from sea shells, fish scales, plastics! Wholesale. Illustrated catalog 10c. Giftcrafts, Box 4550-PM, Coral Gables, Florida.

**PROFITABLE Home business.** Make fast-seller chenille monkey trees, dolls, flowers. Terrific holiday demand. Information free. Velva, Bohemia 16, N. Y.

**TO \$35.00 Weekly.** Spare time, home operated, mailorder business. Successful "beginner's" plan. Everything supplied. Lynn, 10420-M National, Los Angeles 34, Calif.

**LIQUID Rubber,** make flexible molds. Free sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

**RAISE Fishworms.** Easy, profitable. Complete instructions 25c. Huffmans Worm Ranch, Rives Junction, Mich.

**FIX Typewriters.** Free booklet describes our modern, inexpensive home-study course. Factory methods taught. Write: Typewriter, Building 1, Tarentum, Penna.

**\$25 WEEKLY** Working two hours daily. No canvassing. No manufacturing. Lycke, Box 2471-A, Cleveland 12, Ohio.

**RESILVERING Mirrors,** formula 50c; two-way lookout mirrors, (No one sees you), 50c; coppered mirrors, 50c. All \$1.00. Nelko-Mir, Box 3452-J, Chicago 54.

**FIGURINE Molds** and many others, liquid rubber, statuary plasters, flock finishes, Olo-candle wax, etc. Illustrated catalog and "Plastercraft" manual free. Blue Rapids Supply, Blue Rapids, Kansas.

**START Home manufacturing business.** Make cleaners, soaps, polishes, cosmetics. Free literature. Kemix, Park Ridge, Ill.

**BIG Profits** making new greaseless doughnuts. Start in kitchen. Wholesale to grocers and cafes. Free plans. M. Ray Company, 3605 South 15th Ave., Minneapolis 7, Minnesota.

**MAKE Money** spare or full time, casting metal toys and novelties. Big wholesale and chain store demand for autos, soldiers, ashtrays, banks, etc., keeps manufacturers busy. Production moulds furnished for up to 100 and more castings per hour. No experience or special place necessary. Write for information and illustrations of patterns needed. Metal Cast Products Co., Dept. A, 1696 Boston Road, New York 60, N. Y.

**NEW Exceptionally profitable plans,** ideas for home operated mail business. Rush name. Miller, 1772-P Carlyon Road, East Cleveland 12, Ohio.

**MAKE Flexible molds!** Cast plaques, bookends, figurines! Free sample! H. Tooker, 630-R Chestnut, Hamilton, Ohio.

**RECAST Old batteries** into new. Latest achievements. Battery Laboratories, Minneapolis.

**READ "Advance"**—The voice of mail order. Offers money-making opportunities, sources of supply, personal guidance, etc. Issued monthly. Sample copy 35c. Yearly subscription \$2.00. Advance Publishing Company, 313 East 21st Street, Suite 450, New York 10, N. Y.

**GOOD Paying business** silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required. Outfit furnished. Free booklet. Gunmetal Co., Ave. H, Decatur, Illinois.

**BUY Wholesale.** Thousands articles. Supply directory, 10c. Idealeco, Park Ridge, Illinois.

**EARN Extra money!** "Homeworker Magazine" tells how. Sample 25c. Sizemore, Box 7, 4917 Kostner, Chicago 30.

**EXTRA Money—No selling,** operate vendors. Amazing profits, details free. Silver King, Suite 220, 622 Diversey, Chicago 14.

**OPERATE Profitable mail order business.** Write Walter Service, 4159-A East 112th, Cleveland 5, Ohio.

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**COLORGLAZED Concrete** pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries Company, Grand Rapids, Minnesota.

**FREE Book "505 Odd, Successful Businesses."** Work home. Expect something odd! Pacific, Oceanside, Calif.

**POPCORN** And potato chip equipment. Long Eakins Company, 5360 High, Springfield 99, Ohio.

**START Venetian blind laundry.** Profitable lifetime business. New machine. Free booklet. F. C. Co., 442 N. Seneca, Wichita 12, Kansas.

**SELL Books** by mail! Wholesale catalog, 25c. Monarch, Auburn, New York.

**MAKE Money** from newspaper clippings. Siegel, Box 183 PM, New York 2.

**VENDING Machines—No selling.** Operate a route of coin machines and earn amazing profits. 32-page catalog free. Parkway Machine Corporation, Dept. 72, 715 Ensor St., Baltimore 2, Md.

**BE Independent.** Small investment. Full-time or part-time. "Reel chair" for jobs large or small. Cleaning, painting, repairing, window-washing, etc. Write Finney Co., Platteville, Wisconsin.



**137 PLANS** For starting home business. Details: Elite Co., 220 Grand St., New York 13.

**WANTED!** Home producers, by manufacturers in our clearing house service. Become a sub-contractor, casting plastic products for these companies. Thousands of easy-to-make items required for consumer and industrial use. Cash in at home, without previous experience. Write Plastic Service Associates, Dept. PM5, East Boston 28, Mass.

**MAKE** Perfume. Sell on smell. Mail order or local. Wilson made \$7200.00 first year. Free sample, plan revealed. McCann, 4019-21 Rio Grande, Amarillo, Texas.

**FREE** Wholesale catalog. Make up to 500%. Be your own boss, work full or spare time. Everyone a prospective customer. Sell costume jewelry, wrist watches, religious items, novelties, toys, gifts and prizes. Write today, specify catalog PM4, Heath Distributing Company, 3253 Vineville Avenue, Macon, Georgia.

**OPERATE** "Escalator" mailorder system, selling our products or any products. Fastest, most revolutionary mailorder system known. Write: Selbyco, Decatur 156, Ill.

**MAKE** Money at home as renewal headquarters for all magazines. Liberal commissions. No experience, no capital needed. Supplies furnished. Write for free catalog. McGregor Magazine Agency, Dept. 500B, Mount Morris, Ill.

**OPERATE** Profitable mailorder business. Details. Natel, 411-C Paulison, Passaic, N. J.

**WHERE** To buy at wholesale 100,000 articles. Free list. Also extra-income information. Maywoode, 1135 Broadway, New York.

**"FLOATING** Henryburger" Systems franchise. Rare opportunity. Small investment. Box 936PM, Wichita, Kansas.

**LEARN** Metalizing baby shoes, gifts, etc. Bronze, gold, silver. Pollo free. Kiklav, 7217-PM South Broadway, Los Angeles 3.

**\$200 WEEK** Possible! Sensational new hand cleaner. Manufacture, distribute. Easy. Free plan! Keenelo, 2445 Larimer, Denver 2, Colorado.

**EARN** Money with typewriter, sewing machine! Details free. Edwards, 3915-PM, 12th, Des Moines 13, Iowa.

**HAVE** Home mail business. Big earnings. Everything furnished. Start low as \$150. NMD Agency, Box 88, Dorchester, 22-A, Mass.

**50 PLANS** For home mail business. Proven money-makers. Personal help assures success. Verdo, R1, Box 37-A, Huntsville, Missouri.

**PEARL** Finishing. New amazing home, full-time business. Free success plan. Pearllette, Box 73136, Los Angeles 3.

**EARN** \$2.00 Hour, I do, making sandals. Chas. Youngs, 1308 S. First, Arcadia, California.

**EARTHWORM** Breeding? First, get unusual story. "An Earthworm Turned His Life." Free. Earthmaster, Dept. 14, El Monte, Calif.

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**SELL** Snowballs. You make them. Big profits. Free circulars of needed supplies. Snowball Company, 9534 Lemturner, Jacksonville 8, Fla.

**BE** Independent, be secure, have your own profitable business—Earn \$20.00 and more a day making beautiful, fast-selling lamps at home. No equipment needed. Illustrated course teaches you quickly. Course, parts catalog, wholesale price list—only \$2. Gearon Co., Dept. 200-B-6, 27 S. Desplaines, Chicago 6, Ill.

**\$10,800 PROFITS!** Your own mailorder business! No capital risk! "Success plan" (worth \$2) free! Write today! Treasury, 709 Webster, New Rochelle PM-12, New York.

**NOTARY** Public commands more money. Be one. Stationers, Helotes, Texas.

**"THANK** You, call again" and 1999 other ultra-blue 7"x11" signs—Comedy, general, religious. Retail 50c each! 15 samples, \$1.00. Lowy, 812 Broadway, Dept. 735, New York 3.

**EARN** Money evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle 1, Wisconsin.

**SELL** By mail. Chamberlain Books, 87 Arizona Place, Chandler, Arizona.

**RAISE** Earthworms. Easy, profitable. Free instructions. Earthworm Gardens, 224 West Valley, El Monte, California.

**WIN** Contest money. General Contest Bulletin gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609½ East 5th, Duluth, Minnesota.

**TIE-Breaker** picture puzzles exposed. \$5.00. Wenograd, Box 1495, Philadelphia 5, Penna.

**FREE!** Your own mailorder business! Everything furnished! No investment! Terrific profits! Write today. California Vitamins, 2910PM Beverly Blvd., Los Angeles 4, California.

**FREE** Booklet reveals amazing secrets behind 301 new profitable enterprises! Many mailorder! Includes confidential instructions for starting wholesale buying service. Deumant Business Surveys, 83-R Deumant, Kenmore 23, N. Y.

**500,000 ITEMS** Wholesale! Sources, plans, formulas, tips in big "Profitmaker" folio. 25c. United, Box 87-M, Detroit 2.

**THE** Miracle cleaner for upholstery, rugs, woodwork. Write Mom's Products, West, 1011 Carlisle, Spokane 17, Wash.

**SELL** Your own ideas copy magazine. Details dime. Zen Publications, Elkhart, Ind.

**MAILORDER** Dollars unlimited. No investment. Reimer, 161 a Weirfield, Brooklyn 21, N. Y.

**START** A buying service, buy wholesale thousands nationally advertised products. Make big profits selling at sizable discounts. Postcard brings details. American Buyers, 630-R Linden, Buffalo, N. Y.

**WHITE** Tire cleaner—Concentrated powder, add water. \$1.00 postpaid. Menyo, Box 234, Inyokern, Calif.

**MEN—Women.** Make money spare time plus new car as bonus for encouragement. Amazing hosiery guaranteed to wear without holes, snags, and runs, or replaced free. For example, lovely 60 gauge nylons guaranteed for as long as 1½ years, or replaced free. Write Wilknit, 1736 Wash., Greenfield, Ohio.

**FREE** Success plan. Any business—Spare, full time. Shocker! Write: Trends-B36, Box 5564, Crosstown Station, Memphis, Tennessee.

**PARTNERS** Wanted. Patented appliances. Dr. Roberts, 111 N. Stevens St., Valdosta, Ga.

**SELL** Hydrocaps increases battery life 25%. Good profit, every car owner buys. Real spare time money maker. Write for details today. Aviaparts, Box 884, Coral Gables, Fla.

**GROW** Miniature dwarfed trees, instructions 50c. Metro, Box 103c, Berwyn, Ill.

**WE** Pay cash for boxtops, labels, wrappers, coupons, etc! Particulars free. Boxtops, PM-983 E. Main, Columbus 5, Ohio.

**BUY** Wholesale! Nationally advertised appliances, housewares, jewelry, watches, etc. Free information concerning tremendous discounts. Econ-O-Mart, Box 535, Morristown, New Jersey.

**INSTALL** Hand railings on stairs, terraces, porches. Unlimited applications. Provides safety. Cast aluminum universal joints lock with set screws. 1½ inch aluminum tubing will not rust. Easy to assemble. Fits any angle or grade. Install in wood, stone, ground or concrete. Profitable. Send for folder. Kloppenborg Aluminum Foundry, Dept. PMC-3, Davenport, Iowa.

**400 RADIO** Stations active. Free radio advertising. Pay commission only on orders received. Free information. Mishek, 2, Waseca, Minn.

**ASSEMBLE** Electric fans. Exhaust and circulating for home, attic, kitchens, restaurants, offices, factories. Sells easily. You furnish electric motors; we furnish all fan parts. Send for wholesale parts catalog. Kloppenborg Aluminum Foundry, Dept. PMC-3, Davenport, Iowa.

**CASH** In your ideas. Complete information now available. Prepared by experienced engineer-inventor. \$1.00. Full refund provision. O. W. Wood, 100 Church Street, Liberty Corner, New Jersey.

**MAKE** Money at home! New folio "Homework as a Profitable Endeavor" tells how. Only 25c (refundable). Opportunities, Folio-A, Box 209, New York 28.

**SELL** Titania gems; \$9.75 carat wholesale. More brilliant than diamonds. Free catalogue. Diamonite, 1404-M Mitchell, Oakland 1, California.

**SCHUHMACHER** Matmakers. Convert old tires into dollars. Devote full or spare time. S and S Patents, Inc., 1307 North Clark St., Chicago 10, Ill.

**50,000 ARTICLES** Wholesale. Source directory, dime. Nelko, Box 3462-DR, Chicago 54.

**PUBLISH** Your own magazine. Handsome 52 page format, well edited, illustrated. Cost low as \$1.00 month. Brings you prestige, profits, 25c brings sample, details. National, Ord, Nebr.

**137 PLANS** To make money, local mailorder. Details: Elite Co., 220 Grand St., New York 13.

**READ** Progressive Mailtrade, the magazine that tells how to make money by mail. Dime brings sample and special offer. Progressive Mailtrade, Box 357, Sheboygan, Wisconsin.

**FREE** Book "505 Odd, Successful Businesses." Work home. Expect something odd! Pacific, Oceanside, Calif.

**SPARETIME** Profits taking subscriptions, all magazines. Wholesale catalog free. Cassell Agency, Westfield 2, New Jersey.

**HOBBYISTS!** There's profit in hobbies. Investigate. Cramer, 11 Hanna Road, Worcester 2, Mass.

**EXPERIENCED** Roof repairer. Franchise protection. Luster-Kote, 19417 Derby, Detroit, Mich.

**\$5.00 PER** Hour assembling driftwood lamps. Sam Patchett, 2187 N.W. 24 Court, Miami, Florida.

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**SPARE** Time homework opportunities, easy, profitable. Stamped envelope brings details. Alfred Hasemann, Beecher, Ill.

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**PRODUCT** Analysis. Manufacturing formulas and processes developed. Plastics, Box 1574, Boston 4, Mass.

**FREE** Formula catalog. Anything analyzed \$35. Western Chemical, Salem, Ore.

**HEADQUARTERS** For: Formularies, references, engineering handbooks. Literature free. Paullin, 109PF, Loudonville, Ohio.

**ANY** Formula \$3.00. Chemical Instruction Sheet—catalog 10c. J. Belfort, 218 W. Jackson, Chicago 6.

**YOU** Can make big money with the right formulas. Write Alliance Sales, 568-M, Alliance, Nebraska.

**RESEARCHER.** Information, formulas, supply sources. Consultation fee, fifty dollars, up. A. Di Grezio, Research Bureau, 43 Washington Street, Boston, Mass.

**MILLER'S** Modern manufacturing formulas make fast-selling products that get the business and pay. Fifty years supplying the best. Late literature free! Miller, Consulting Chemist, Tampa, Florida.

**REAL** Manufacturing formulas. Lists free. Cummings, Chemist, Gordon Ave., Syracuse 4, N. Y.

**FORMULAS:** All kinds. Latest, best. Literature free. Kemixal, Park Ridge, Ill.

**GENUINE** Manufacturing formulas. Latest. Literature free. Nelko, 3462-P Merchandise Mart, Chicago 54.

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**MODELING** Plastic. Looks and molds like modeling clay. Bakes in kitchen oven to hard plastic. Make toys, figurines. Kit, 6 colors, \$2.00. Plastibake, Dept. 6M, 700 2nd Ave., San Francisco 18, Calif.

**PLASTIC** Scrap—5 lb., \$2.50. 100% useable. Boin Company, Morristown, N. J.

**PLASTICS** Home-craft course for men and women. Tells and shows how to make hundreds of fast selling plastics products. All plastics and materials for 23 projects included in course. No special tools needed. Course pays for itself. Write for free booklet. Interstate Training Service, Dept. D3F, Portland 13, Oregon.

**PLASTICS—Lucite, Plexiglas, Acetate, Vinylite, Polyester-Fiberglas.** Low, low prices. Value-packed, bargain-filled catalog 10c. Airmailed 25c. Gem-O-Lite, Box 6862Y, North Hollywood, California.

**LAMINATED** Plastics, special parts; projects; drill jigs, etc. Free estimate. Harry Smith Specialties, Box 9378, Akron, Ohio.



**NEW** Liquid casting plastic. Clear, colors. Embed flowers, insects, coins. Saw, drill, carve. Send 25c for Castolite Creations Manual and proved success plan showing how to make money at home. Castolite, Dept. G-101, Woodstock, Ill.

**FREE** List—Jewelry findings, lucite, plexiglas, internal carving drills, dyes, supplies, pens, emblems, medallions, insignia, chain, ear wires; many others. Caraday, Dept. PM2, Box 71, Ryder Station, Brooklyn 34, New York.

**LIQUID** Plastics, clear 68c, Lucite 52c, others. Plastic dough, hardeners, promoters, liquid rubber. Where to buy direct, wholesale; directory \$2.98. Castle's Co., Box 2139, Paterson, New Jersey.

**LUCITE**, Plexiglas. Any size sheets, masked. Square foot (12 x 12) cost, 1/16", \$1.20; 1/8", \$1.40; 3/16", \$1.75; 1/4", \$2.08. Include 10% postage. Almac Plastics, 600 Broadway, New York City.

**PLASTIC**, Sheets, rods, tubes, etc. Free list. Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 7, Mo.

## CHEMISTRY

**CHEMICALS**, Supplies. Catalog 15c. Laboratory Sales, Box 161-T, Brighton, Mass.

**SPECTROSCOPE** For quick chemical analysis \$3.00. Book 200 electric stunts \$1.00. Kutting Sons, Los Altos, Calif.

**AMAZING** New book of science. Experiments, formulas and catalogue of laboratory supplies. Only 25c. National Scientific Co., Dept. 16, 2204 W. North Ave., Chicago 47, Ill.

**SECOND** Printing, improved version, spectacular chemical fireworks experiments manual. Contains complete set-ups, formulas, instructions on thermites, fulminates, explosive powders, etc. Still \$1.00. Free details. Chemi-Tech Laboratories, 568CA Riley, Buffalo 8, New York. Chemical questions answered. Your start for July 4th, now!

**NEW** Idea chemical and apparatus outfits for home experimenting. Photo-scales, microscopes, chemicals, biological and laboratory supplies in small quantities. Catalog 25c. Established 1931. John H. Winn, 124A West 23rd Street, New York, N. Y.

**ILLUSTRATED** Catalog: Chemistry, mineralogy, biology, 10c. Tracey Laboratories, Evanston, Illinois.

**CHEMICALS** And apparatus for industrial, analytical, and private laboratories. Catalog 25c. Dept. M-50, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N. Y.

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**MAKE** Extra money for yourself, club or church. Up to 100% profit selling Christmas, all-occasion greeting card assortments to friends, others. Leading 21 card \$1.00 boxes, religious and novel, gift wrappings, ribbons, stationery, animated books, unusual gift items. Deluxe imprinted personal Christmas cards. Experience unnecessary. Write for samples on approval, special offers, extra 5% bonus plan. Hedenkamp, 361 Broadway, Dept. PM-27, New York.

**AMAZING** Profits selling exclusive Sunshine Christmas cards: Nature prints, scripture text, imprints, nationally famous. 21 for \$1.00 assortments all sell on sight! Many others! Also gift wraps, stationery, etc. Send for samples on approval. Sunshine Art Studios, Inc., Dept. PM-6, Springfield 1, Mass.; Pasadena 3, California. (Note: East of Rockies address Springfield office.)

**MEXICAN** Feather pictures. High profit! Fast sellers! Adelphi, Box 57-B, Bellerose 26, N. Y.

**MAKE** Money introducing world's cutest children's dresses. Big selection adorable styles. Low prices. Complete display free. Rush name, Harford, Dept. J-7341, Cincinnati 25, Ohio.

**SALESMEN**, Distributors, fast selling costume jewelry direct from factory. Big picture catalog, free. Pickcraft, M19 Bank, Attleboro, Massachusetts.

**GOLD**, Silver lacquered letters. Windows, doors, trucks, Standard sizes. Penny and up. Big profits. Samples. Atlas-D, 544 West 79th, Chicago 20.

**500% PROFIT** Selling multicolor, ready-made cardboard signs for every business. Dynamic samples and catalog. 25c. M. Velvetex, 200 W. 34 St., New York 1.

**MEN'S** Dress box \$1.25 dozen. Free catalog. Gainor, 760 Book Bldg., Detroit 26, Michigan.

**BALL** Pens \$10.00 gross, d.e. s.e. blades \$4.20 M, assorted plastic aprons \$1.50 dozen up. Lutzker, 871-JP East 170th, New York City 59.

**CLARESA** Chrome polish cleans and sells in a hurry. Claresa Chemical Co., Irwin, Penna.

**BUY** Wholesale. 25,000 items. Catalogue 25c. Matthews, 1472-B-8 Broadway, New York City 38.

**MEXICAN** Feather pictures. Sell on sight; 200% profit! Free details. Sample 20c stamps. (No coins). Sylviap, Apartado 9036, Mexico City.

**SELL** Amazing new bug remover cloths to service stations, etc. Terrific possibilities. Send 60c for sample and information. Maurice DeClerg, Portland, Michigan.

**MAGAZINE** Subscription agents. Highest commissions. Bonus. Qualified Publications, 451H Kingston, Brooklyn 25, N. Y.

**BUY** Wholesale thousands nationally advertised products at big discount. Free wholesale plan. American Buyers, 629-R Linden, Buffalo, N. Y.

**\$50.00** MADE Selling occasional cards, 2 dollar boxes \$1.35. Diehl's, Buffalo 5, N. Y.

**SELL** Big money maker to men and women. Easy handwork makes fast-selling useful articles. Sample free. Sunmade Company, Brockton 64, Massachusetts.

**SELL** Every home attractive mail box name plate. Write. Nelson's, 720 East 73rd, Chicago 19, Illinois.

**POWER** Mowers—\$32.20 net. Home agents. Farmco PM, Excelsior Springs, Mo.

**EARNINGS** Unlimited. Million prospects. Repeats. No investment. Reimer, 161 b Weirfield, Brooklyn 21, N. Y.

**DOLLARS** In easy to take orders for photostatic copies. A real year 'round money maker. Every call a prospect. House to house agents looking for additional line will welcome this. Get full information. Quick Copy Service, 175 West Jackson Blvd., Room A-414, Chicago 4, Illinois.

**KILL** Flies, insects (all kinds) instantly. For homes, restaurants, hotels, hospitals. Amazing (low priced) invention. Whirlwind seller. Tremendous profits. Walco Industries, Dept. 63-C, Highland Park, Ill.

**STYLISH**. Cheap. Sensational plan, stamp. Spectacles, 112 Adams, Hoboken 8, New Jersey.

**MAKE** Extra money. Sell front door name plates to friends, neighbors. Retail \$1.98; you make \$1.00! Free selling kit. Modern Engraving Co., P.O. Box 194, Boston 14, Mass.

**AMAZING** Nylon stockings guaranteed to one year or replaced free if they run or snag! Complete line men's and children's hosiery also guaranteed one year or replaced free! Earn to \$3 an hour spare time. Pay nothing. Risk nothing. Just write orders. We deliver and collect. Advance cash plus huge 40% bonus. Watkins sent 92 orders one day. Armstrong earned \$202 in 9 days. Opportunity become manager appointing others. Rush postcard for free samples and money-making outfits. Kendex, Babylon 13, N. Y.

**FAST** Profits—No investment. Plastic aprons, tablecloths, etc., 300 sure-fire items. We guarantee sales. Free information. Halliday Co., Dept. PM, 15 Pennington Ave., Passaic, N. J.

**WHOLESALE** Catalog. Nationally advertised appliances, cameras, watches, etc. Cam Co., 1717PM—58th St., Brooklyn 4, N. Y.

**ABSOLUTELY** Free—Sales kit. Yours for the asking. Send postcard today requesting kit showing new line, belt buckles with your name or personal initials, cap badges, choice 3000 different emblems. Write Hook-Fast, Box 1425PM, Providence, R. I.

**'53** WHOLESALE Dealer kit on appliances, typewriters, recorders, cameras, giftware, etc. Free. Write Arrow Distributing, 154-B Nassau Street, New York.

**CALIFORNIA** Sweet smelling beads. Sensational sellers. Free particulars. Mission, 2328PM West Pico, Los Angeles 6, Calif.

**YOUR** Own business—Used suits \$1.50, overcoats 65c, mackinaws 35c, shoes 12½c, ladies coats 30c, dresses 15c. Enormous profits. Catalog free. Moro, 558-AA Roosevelt, Chicago 7.

**AGENTS**: Stamping names on key protectors. Sample 25c. Stamping outfits, checks, social security and name plates. Hart Mfg. Co., 303 Degraw St., Brooklyn, N. Y.

**AGENTS**—300% Profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 431-D North Clark, Chicago.

**EXCELLENT** Sideline for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also, make money with our line of automobile initials and sign letters. Free samples. "Ralco" XL-Roxbury, Boston 19, Mass.

**JOKESTER'S** Printed novelties. Fifty—\$1.00. Sebastian, 10934-X Hamlin, North Hollywood, California.

**HAND** Cleaners and other specialties. Sell industrial plants, institutions, etc. Liberal commissions. Dytex Chemical, India Street, Providence, R. I.

**BUY** Wholesale from nationally advertised manufacturers, distributors. Literature free. Carter Publications, Box 6011-G, Chicago 80.

**BE** A money maker. Use your home as magazine headquarters. Liberal commissions. No experience. No capital needed. Everything furnished. Write for free catalog. McGregor Magazine Agency, Dept. 500A, Mount Morris, Ill.

**PRINTING**, Salesbooks, envelopes. Free illustrated catalog. Ersco, Dept. PM, Bronx 72, New York.

**REPEAT** Business and high commissions raising dwarf trees for pleasure and profit. This field practically untouched by salesmen. Handle our growing kits with complete instructions on what until recently was an oriental secret. Write today for free sales plan. Don Pedro Farms, Dept. 10, Rte. 2, Box 1007, Stockton, Calif.

**\$50** WEEKLY Selling finest razor blades, other items. Free details. Edisons, Box 274, Far Rockaway, N. Y.

**BUY** Wholesale! Big profits! Name brand—Appliances, watches, gifts, silverware, etc. Free catalog. Bergen Novelty Sales Co., 59 S. Dean St., Englewood, New Jersey.

**SELL** Harmar's French fried popcorn to stores and taverns. Fast repeater. Harmar Products Co., Hammondsport, N. Y.

**BIG** Profits selling ties (\$2.00 values), \$8.50 dozen. Free catalog. Empire Cravats, 648 Broadway, New York 12.

## SALESMEN—DISTRIBUTORS

**ADVERTISING** Book matches—Cash in on big demand; sell union label matches. Cuts for all businesses and political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. M-653, 7530 Greenwood, Chicago.

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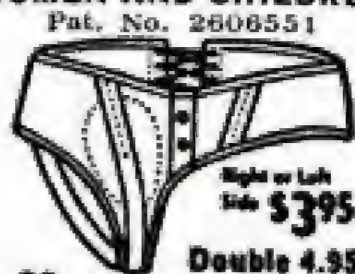
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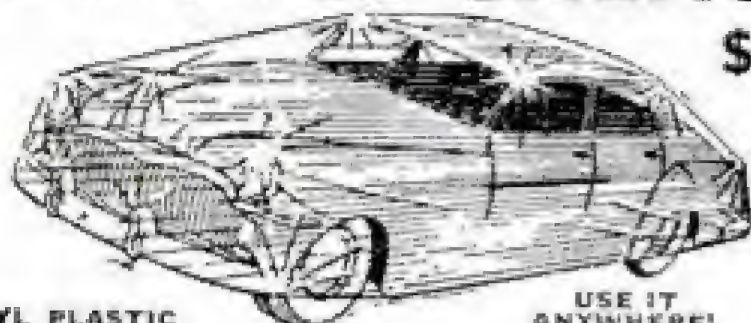
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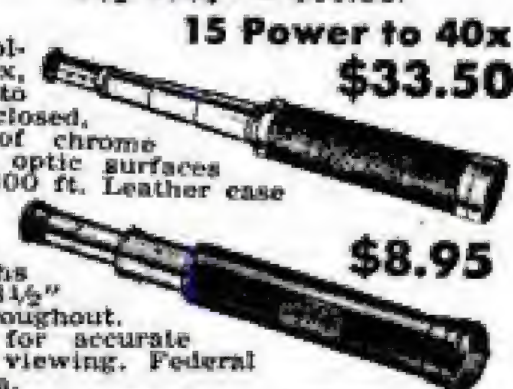
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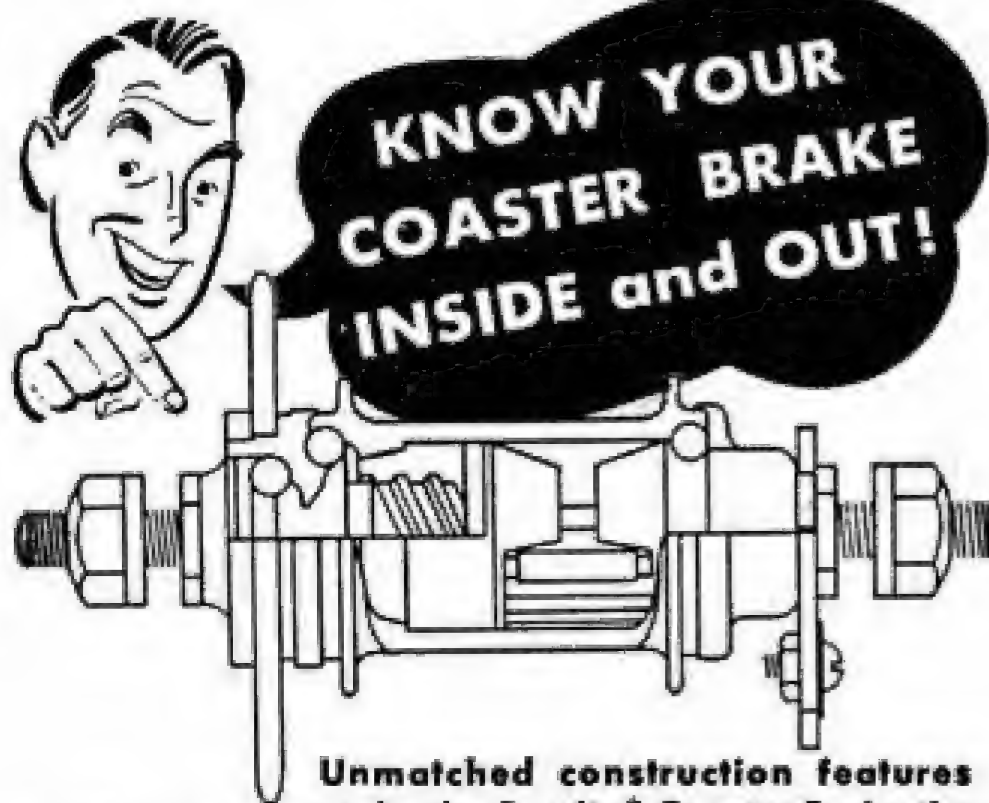
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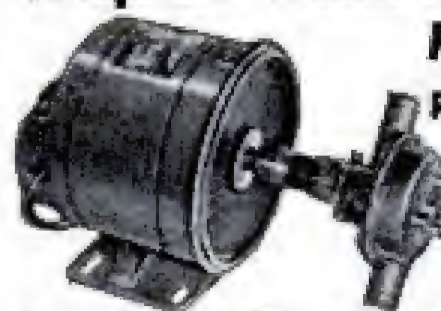
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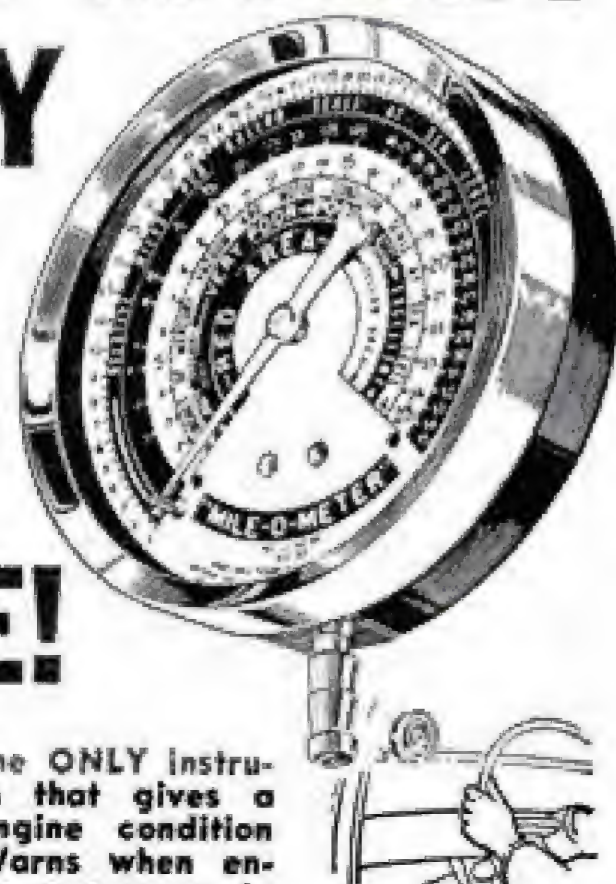
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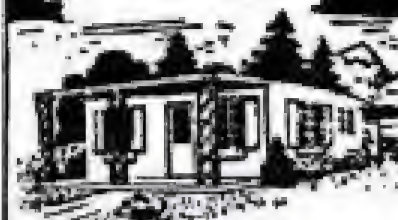
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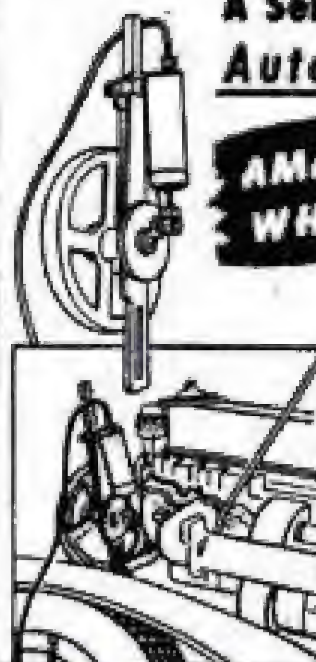
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We believe this is one of the most astonishing and important offers ever made to ambitious people everywhere . . . because we **TEACH YOU** and actually show you how to make the most remarkable, the most unusual line of beautiful and useful things of **ENDLESS VARIETY** with enormous possibilities for **PROFIT and PLEASURE!**

### NO SPECIAL ABILITY REQUIRED!

No previous experience or special ability is required! **NO TOOLS OR MACHINERY** are required . . . the entire process is about as easy as pouring water out of a glass! The **WONDERS OF LIQUID PLASTICS** make all this possible!

### UNLIMITED POSSIBILITIES!

Work with **LIQUID IVORY, LIQUID GLASS, LIQUID MARBLE, LIQUID EBONY, LIQUID PORCELAIN, LIQUID WOOD, LIQUID GEMSTONE** and many other **LIQUID PLASTICS** and in a matter of minutes turn them into an endless and valuable procession of beautiful imbedded jewelry, novelties, ornaments, statues, bookends, lamps, pen-sets, lighters, ashtrays, keychains, figurines, curios, souvenirs, art and gift products, fishing lures, boats, **GADGETS** galore, exquisite **GEMS!** Make gears, tools, dies, forms, handles, dials, knobs, **MACHINE PARTS**, models of inventions, pistol grips . . . the list is endless! The only **LIMITATION** is your **IMAGINATION!**

### WE SUPPLY EVERYTHING

We supply everything: the materials, the ideas, and the free instructions! If you have the need or the desire to make any of the products mentioned above (and countless others), as well as your own pet gadget or invention, then take advantage of our remarkable materials, our unusual process and this great offer today! The possibilities for pleasure and profit are practically unlimited!

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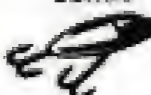
Just send 25c and we will send you our book, **HOW TO MANUFACTURE WITHOUT TOOLS OR MACHINERY**. We will also send you our big 64-page catalog describing all the materials mentioned above. Do it today . . . we want you to share in these wonderful opportunities as soon as possible!

**PLASTICAST CO., (Dept. C)**  
P.O. Box 6737 P.O. Box 987  
Chicago 80, Ill. Palo Alto, Calif.

(Write to either address)



GEARS



FISHING  
LURES



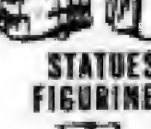
PEN SETS



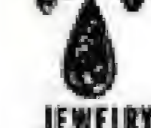
HANDLES  
KNIVES - DIALS



STATUES  
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GADGETS

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**Spare Time—up to \$210.00 a**  
**Week FULL TIME — with Amazing**  
**D-FROST-O-MATIC!**

Millions of housewives want this sensational new Automatic Refrigerator Defroster! No more messy hand defrosting! Just plug in **D-FROST-O-MATIC** and refrigerator is defrosted *automatically* every night! Sales easy, sure when you leave **D-FROST-O-MATIC** on **FREE TRIAL**—housewives won't let you take it out! Saves money, food, time, work! **Big profits for you**—up to \$210.00 a week full time—\$15 to \$20 in just a few spare hours! Start spare time and build big, prosperous business . . . quickly, easily!

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More than 29,000,000 prospects waiting! Rush your name and address today. We'll airmail exciting facts, proof and sure-profit Free Trial plan. No obligation. Write today.

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# Experimenters' Specials

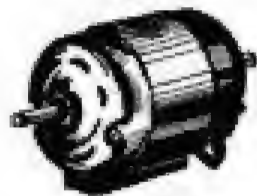
## TACHOMETERS



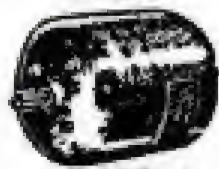
Stewart Warner direct indicating. Supplied with two interchangeable rubber tips. 0-2000 rpm Stock #P-388 and 0-4000 rpm Stock #P-389.

Price P-388 \$5.95 ea.

Price P-389 \$6.95 ea.



P-397  
P-398



P-396

## UNIVERSAL AC/DC MOTORS

115 VOLTS. DELCO No. 68008. 1/40 horsepower. 7,000 rpm loaded. Dual shaft extension. Has two hole mounting base for bench mounting. Ideal for high speed grinder-polisher in home shop. Stock #P-397.

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DEPT. P-10

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for a redwood combination storm window to fit a house window 28 1/2" x 56 1/2" (Screening and glass not included)

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- 4 Is The Guarantee "Unconditional"? See Our Fine Offers Below.
- 5 Can Good Tires Be Bought Cheaper? It's Dangerous To Pay Less.
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650-16	4.24	710-15	4.44
700-16	4.84	760-15	4.74
650-15	3.94	800-15	5.04
700-15	4.14	820-15	5.14
600-20	\$6.74	750-20	\$8.24
650-20	7.34	825-20	13.64
700-20	8.24	900-20	13.94
32x6(8)	8.34	1000-20	13.34
32x6(10)	9.64	1100-20	13.64

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THESE MADE THE BLATT NAME "WORLD FAMOUS"			
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700-16	6.34	710-15	5.54
700-16(6)	7.64	760-15	5.74
750-16	6.84	800-15	6.84
650-19	9.94	820-15	6.74
550-17	4.34	700-15	5.64
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DeLuxe Whitewalls	\$2	Extra	750-20
			12.44
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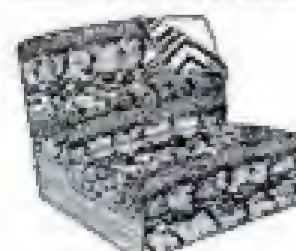
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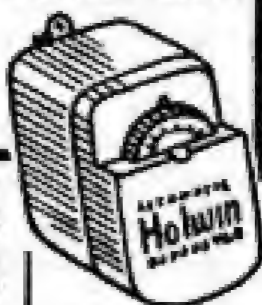
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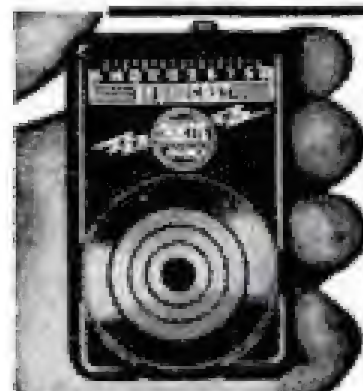
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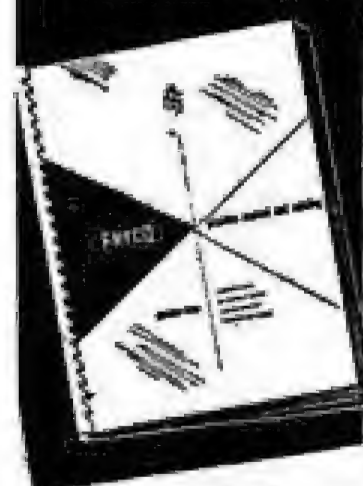
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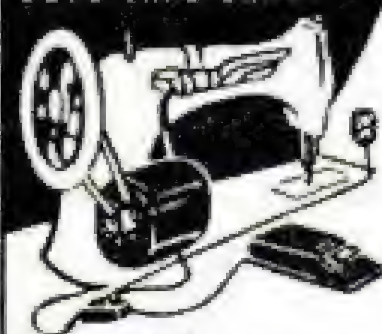
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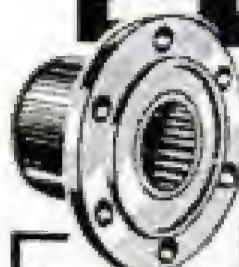
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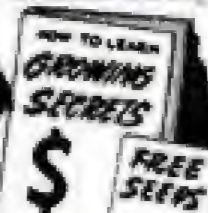
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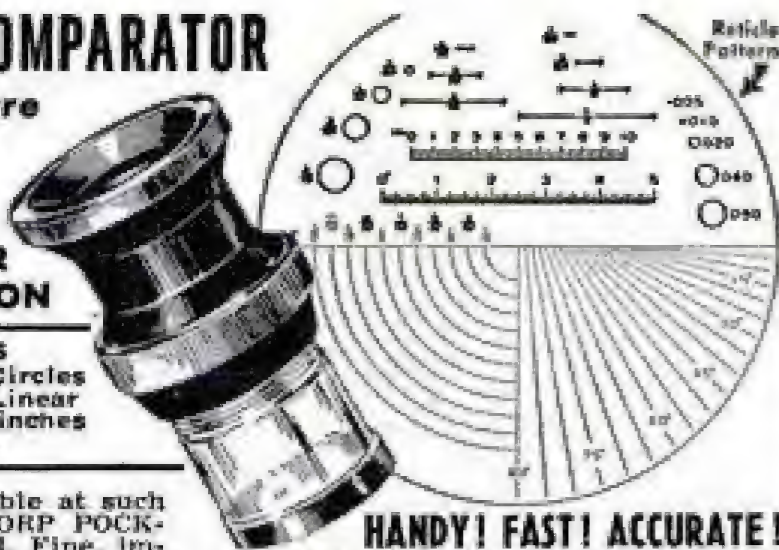
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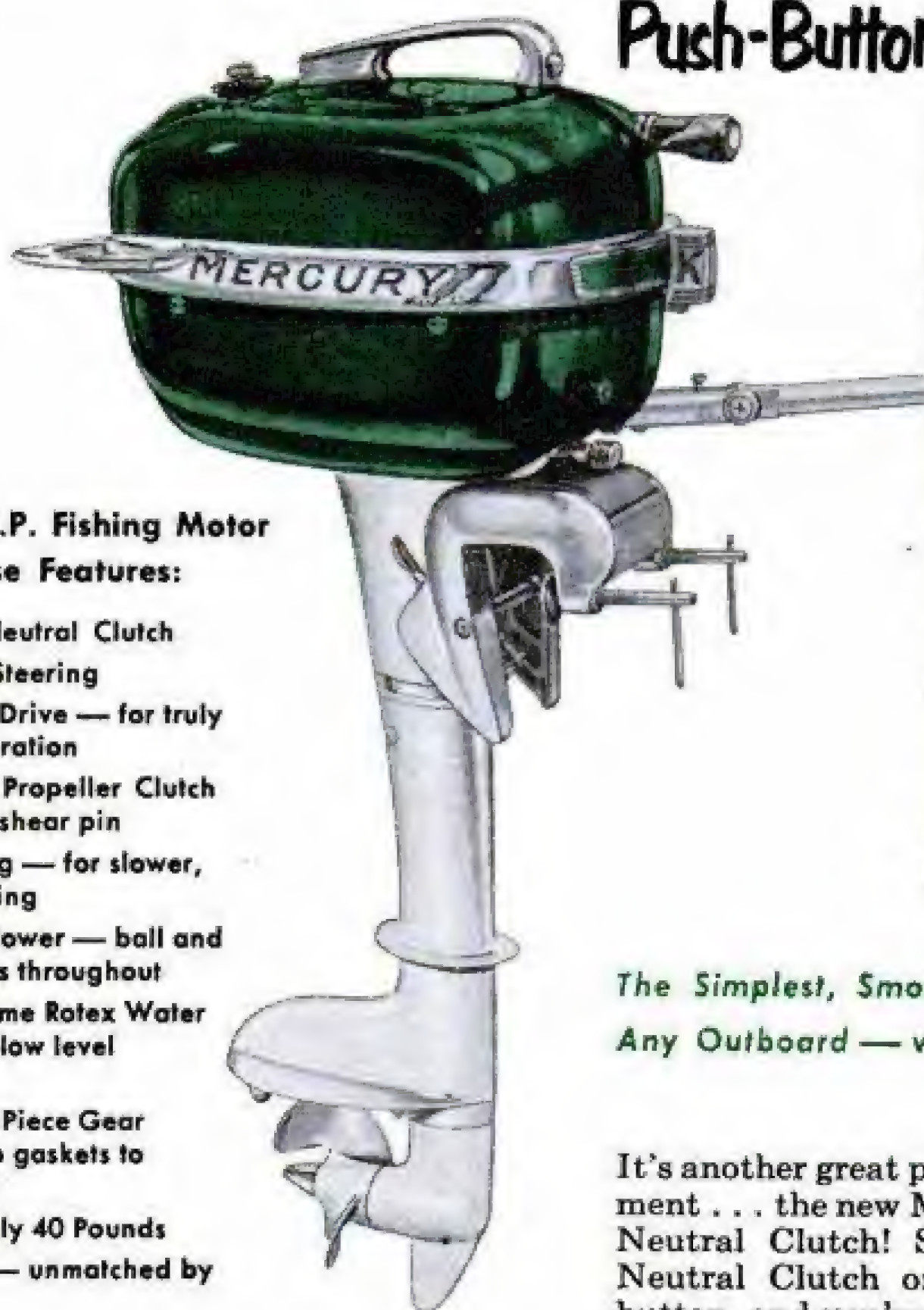


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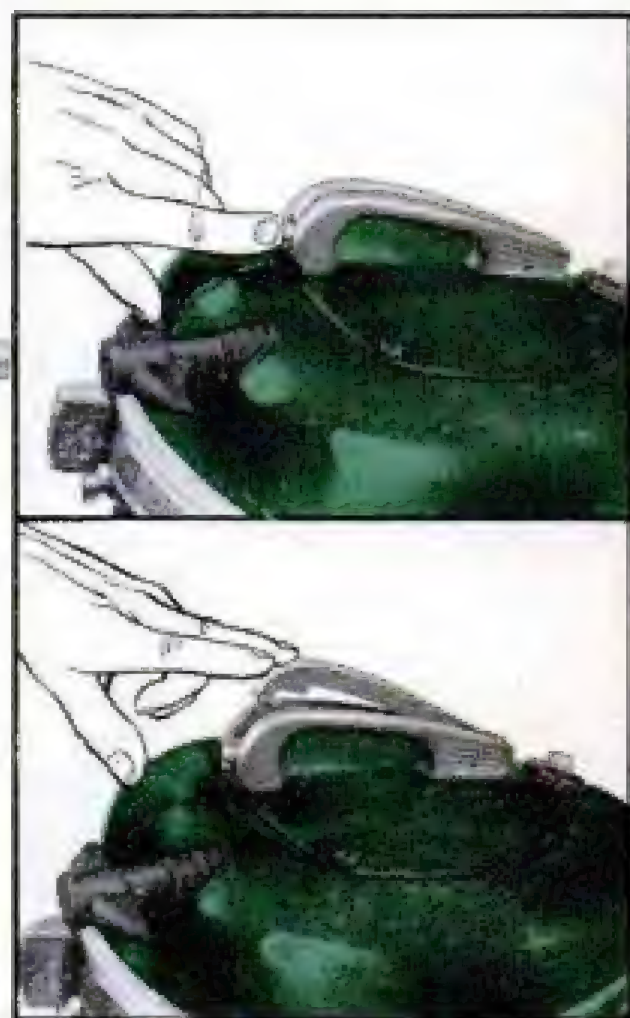
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Features of Mercury motors are protected by issued or pending patents.





Bob Towers photos

Behind Bill Stout is the famed Ford Tri-Motor he designed in the 1920s

By  
Joseph  
Stocker



## THOSE FABULOUS FLYING FORDS

ON A HOT, BRIGHT Sunday a short time ago, at an Air Force jet base in Arizona, something happened that nobody had anticipated. The base was holding open house for the public. Its sleek 600-mile-per-hour jet fighters stood on display in sparkling rows. But it wasn't the jets that caught the fancy of the crowd as much as a large, ancient, odd-looking transport plane with three engines and a corrugated skin.

Some thought it was a cardboard replica of one of America's early airplanes, put there for contrast with the jets. They discovered otherwise when, about midafternoon, a civilian pilot climbed into the plane and gunned the engines. Not even deigning to use the long runway, he took off from one end of the taxi ramp, jumping the big ship into the air before it had rolled more than four plane lengths. Then he put the clumsy craft through three ponderous loops that brought gasps from the crowd.

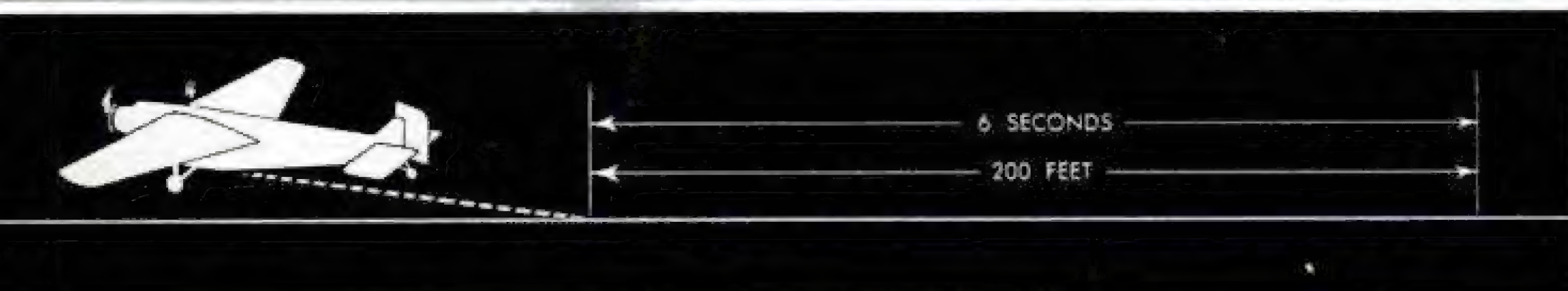
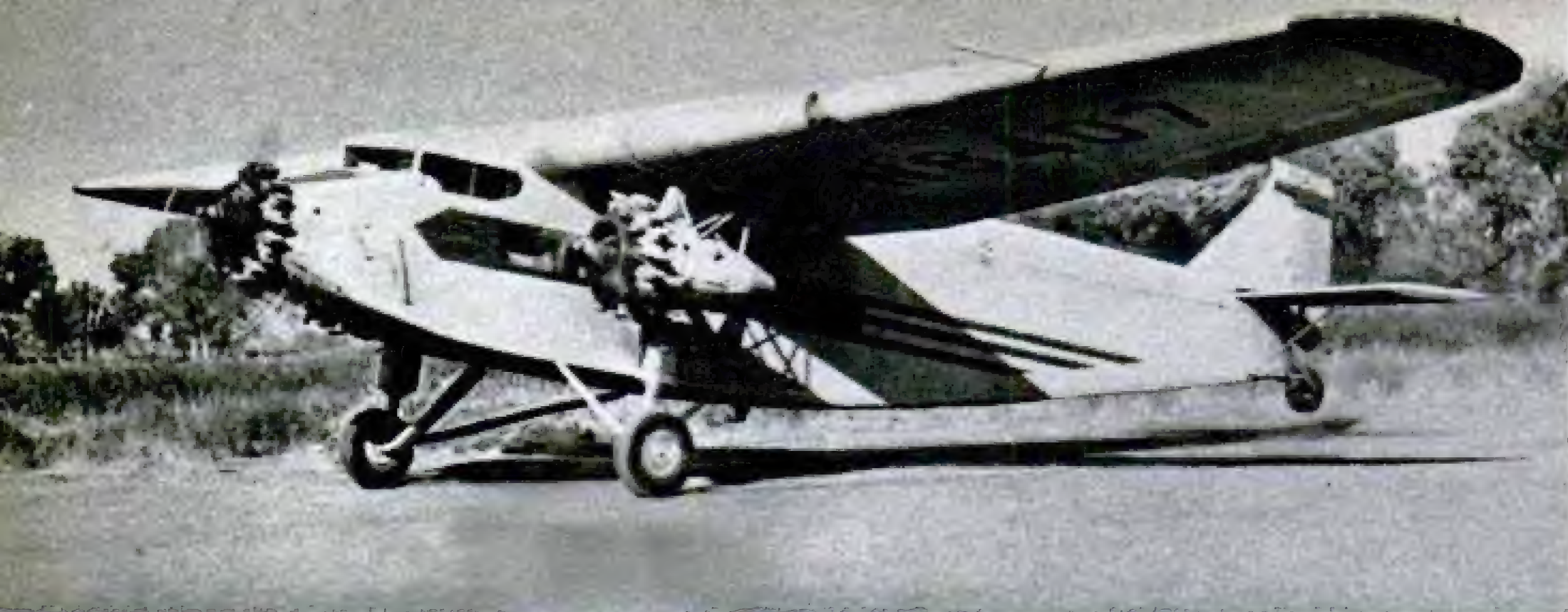
The aerial antique which stole the show from the fancy-pants jets that day was a Ford Tri-Motor, hardy survivor of one of America's first and most distinguished families of aircraft. By all the rules of a swiftly advancing science which makes today's airplane obsolete tomorrow, the Ford should have been dead and forgotten a long time ago. It was built back in the late 1920s, when Lindbergh flew the Atlantic, Coolidge

Corrugated-metal skin and external controls are in sharp contrast to today's smooth, shining fuselages



*A Special Feature in the  
Golden Anniversary of Flight*





**Take-offs are made in a Ford in about six seconds and within 200 feet, or approximately four plane lengths**

was in the White House and anybody was daft who said the stock market might crash.

The Ford was the first all-metal passenger aircraft ever produced. It became the grandfather of the modern airliner and served as the bridge across which America marched into the era of fast commercial air transport. It was also the airplane which flew Adm. Richard E. Byrd across the South Pole in 1929.

Since then, hundreds of other types of planes have been built and flown, then passed into limbo. But the invincible old Ford refuses to be put out to pasture. Of the 200 Tri-Motors turned out by the Ford Motor Company, 40 are still in service.

Most of them are used in foreign lands—in isolated and backward sections of China, Russia, Africa and South America. In places like that, the modern-day airport, as we know it, is nonexistent. Air transport must be geared to short, makeshift airstrips carved out of the bush, the jungle or a mountain clearing. A plane, whatever its size or load, must be able to take off and land within a scant few hundred feet.

The venerable Ford fits these specifications to perfection—and for the very reason that caused Henry Ford to make the Tri-Motor like he did. A quarter century ago, capacious airports were unknown in America, too. An airplane had to be able to get into and out of a farmer's pasture or it was of no use to anybody. The pasture was good enough for the Ford. It landed and took off at 40 to 50 miles per hour—even 30 miles per hour, given a little head-

wind—and with a dozen passengers or a ton or so of cargo. And, in the process, it helped make a whole nation airborne.

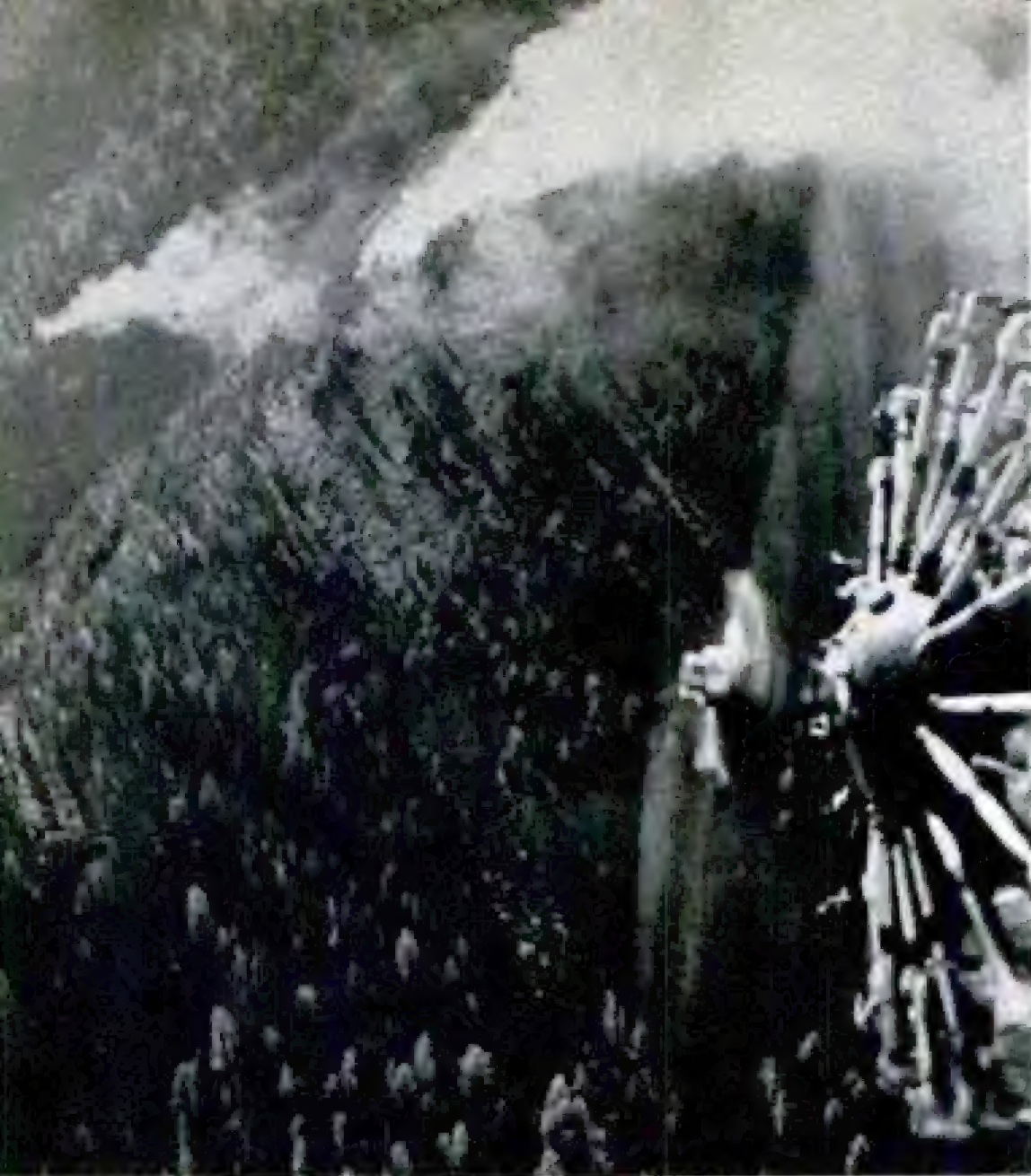
The ship which stole the show that day at the jet base is owned by Rex Williams, a Tolleson, Ariz., crop duster. Williams bought it from Jesse Bristow, manager of the Miami (Fla.) All-American Air Maneuvers, who in turn acquired it from the president of the Dominican Republic. Bristow's pilot took it out of Ciudad Trujillo on two of its three engines.

Flying the Ford is mainly a hobby with Williams. "It's just a plane I always wanted to own," he says.

But he also makes it available on charter to hunters and fishermen. He can haul them and their gear into out-of-the-way mountain-locked airstrips in an hour or two. If they packed in by tedious mule-back, it would take at least a day. The only other plane that could use those airstrips is a Cub, but a Cub can't carry the load a Ford carries.

In place of the 200-horsepower engines for which the Ford originally was designed, Williams' plane is fitted with 450-horsepower Wrights. He paid \$4500 for his Tri-Motor. Later he was offered \$14,000 for it by a Mexican mining outfit that needed something big and nimble for short, heavy hauls into mountainous country. The Ford, capable of flying on two engines with a sizable pay load or one engine with a light load, was just what the doctor ordered. But Williams wouldn't part with it. "There isn't a month goes by that someone doesn't





Tri-Motors are being used now in Montana to drop fire-fighting parachutists directly at blaze scene

try to buy it from me," he proudly states.

Two more Tri-Motors are flying out of Orofino, Idaho, carting vacationers and sportsmen into the remote hill country. And at Missoula, Mont., the Johnson Flying Service uses four for timber-spraying, hauling freight to the mines and dropping smoke jumpers into forest fires. Jumpers like the Ford because its stabilizer is high and there's no danger of snagging their chutes as they leap free.

In the Great Lakes country, from his flying-service base at Put-in-Bay, Ohio, Milton Hershberger keeps a couple of Fords busy island-hopping around Lake Erie. In midwinter, when the lakes are frozen tight and boat traffic is paralyzed, the island folk depend on Hershberger's trusty Tri-Motors for food, hay and the latest newspapers.

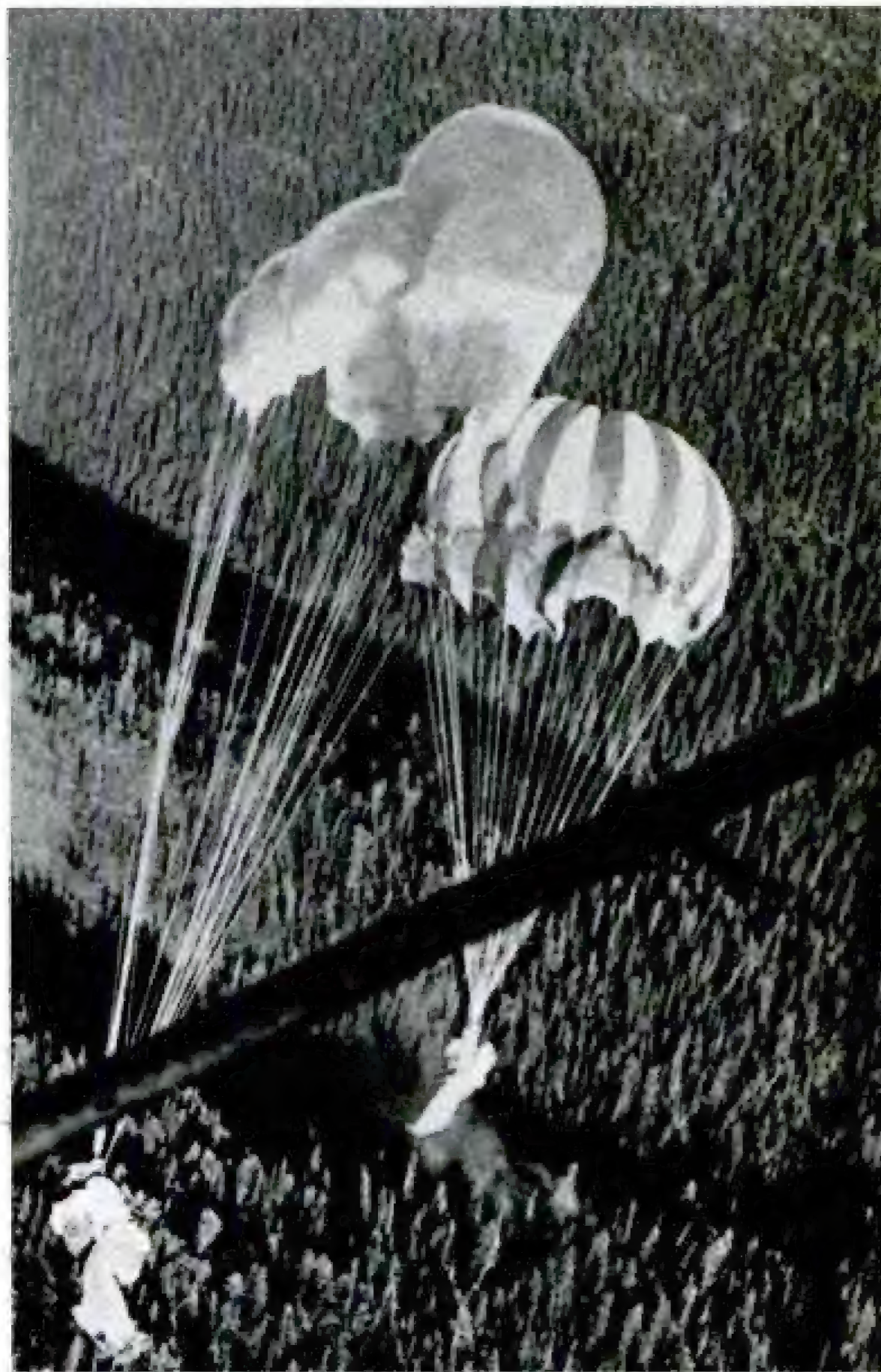
There is something warmly symbolic in the fact that the man who designed the Tri-Motor and supervised its construction for Henry Ford is still alive and working, just like the intrepid old airplane itself. He's William B. Stout, one of the greatest of aviation's pioneers.

Stout developed the first strutless wing and built the first all-metal airplane, a single-engine ship which predated the Ford. That was at a time when nobody thought that anything would ever take the place of fabric and plywood. Stout also built one of the first "roadable" planes with folding wings for air or road travel, and designed one of the first family-type airplanes, a ship with tricycle landing gear



Photos on this page by Robert M. Catlin for Johnson Flying Service

Inside a Ford, a crew chief, above, helps direct the pilot over the jump spot. Smoke jumpers like the Tri-Motor because its stabilizer is high and there is no danger of snagging their chutes as they leave







Twisting into a deep gully, a Tri-Motor swings low above the tree tops on a timber-spraying assignment

which he called the Sky Car. Branching out into other fields, he conceived a prototype of our modern streamlined trains and constructed a streamlined, rear-engine bus.

Today, at 73, Bill Stout continues to search for new answers to the problems of flight. At his laboratories in Phoenix, he is working on a brand-new and revolutionary concept—an airplane with flapping wings that can land and take off without airports.

Even as he keeps one eye on the future, Stout gets a nostalgic satisfaction from knowing that the airplane he built 25 years ago is still serving mankind all over the world.

"It was the leviathan of its day," he says proudly, "and a real engineering achievement with what we had to go on. I don't

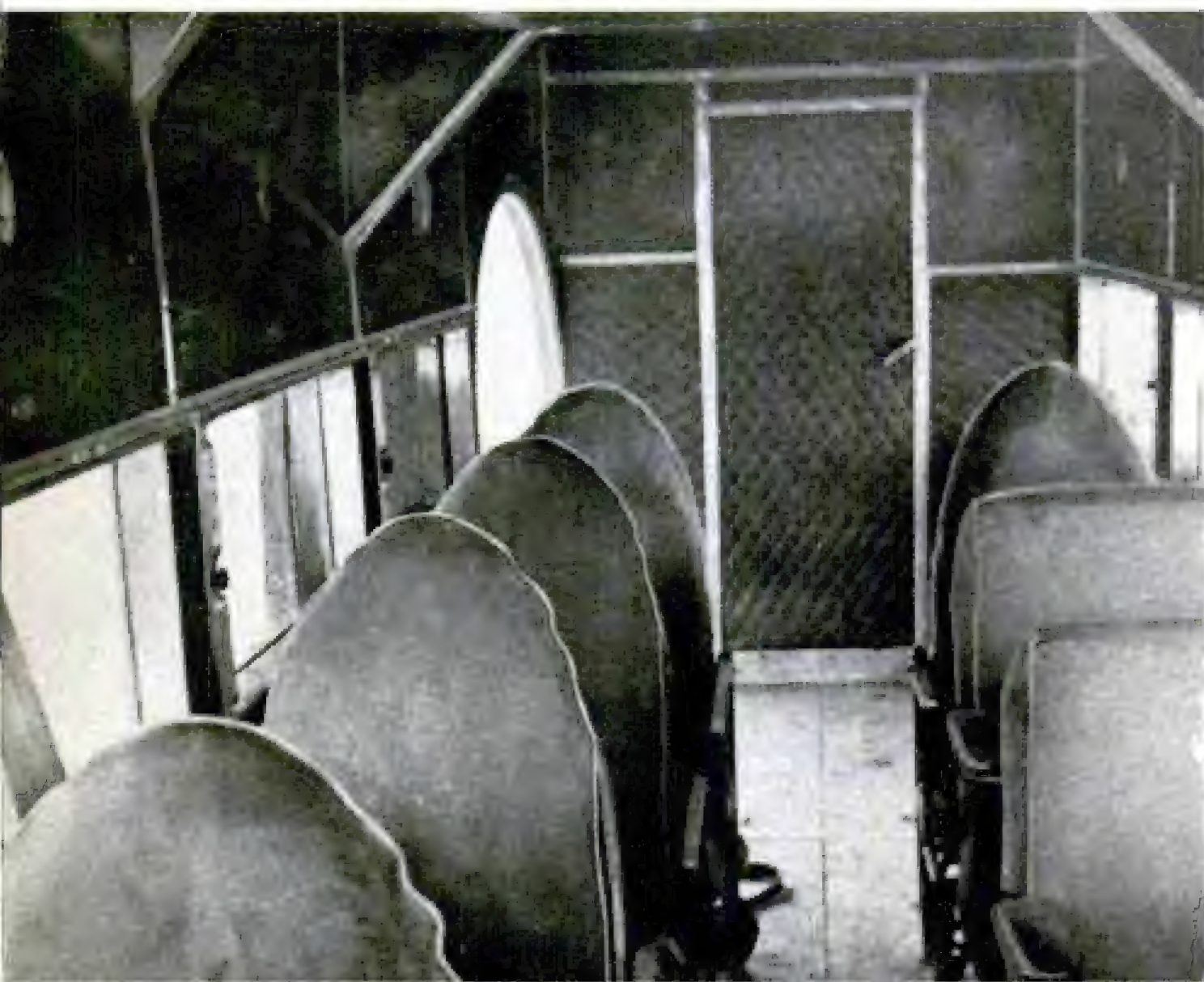
think there's a safer airplane in the world. The Civil Aeronautics Administration tells me there has never been a record of a structural failure in the Ford. Its controllability and flight characteristics are better than any present-day transport ship. In an emergency you could land it in front of my office here. I could sell 100 of them a month right now if I could make them."

The story of Bill Stout and the Ford Tri-Motor is an epoch of success salvaged out of failure. In the middle 1920s he had built a torpedo plane for the Navy. It cracked up on a test flight. Broke and neck-deep in debt, Stout decided to do something brash. He wrote a letter to 100 Detroit business leaders, asking them for \$1000 each as an investment in aviation and promising only one thing: They'd never get it back!

His candor carried the day. Enough money came in to launch the Stout Metal Airplane Company. The firm turned out an all-metal plane, the Maiden Dearborn I, with a single Ford-built Liberty engine. Henry Ford was so impressed that he bought out Stout and made him head of the airplane division of his company.

Stout's original stockholders got their money back after all — \$2000 for every \$1000 invested. Many years later he expressed his conviction that "the greatest single thing I accomplished for aviation was getting Mr. Ford interested in it. . . . From that moment on, Wall Street took aviation seriously and it became a business, not a state-fair exhibition."

Furnishings inside Stout's early airliners were simple, but his sturdy, 14-seat planes flew 200,000 miles the first year without an accident







**Flyable on two or even one engine, Tri-Motors are still sought for hauling jobs in mountainous regions**

Under Ford's banner, Stout produced the famous and incredibly durable Ford Tri-Motor. Only one other ship bore any resemblance to it. That was the three-engine, fabric-covered Fokker. But where the Ford still flies, the Fokker long since has become a memory.

The first Ford had an open cockpit and its outboard engines planted in the wing. The open cockpit was a concession to the pilots—they wouldn't fly unless they could feel the wind on their cheeks so they could tell if they were side-slipping. They also thought the Ford was landing too fast—nearly 60 miles per hour! So they persuaded Stout to give the ship more drag by bringing the outboard engines down below the wing, suspended from struts.

Stout won out on one point, however.

**Oil-pressure and revolutions-per-minute indicator are on strut above an outboard engine, visible to pilots**



After a midwinter flight to Houston in which pilot and mechanic almost froze to death, he set to work enclosing the cockpit. This time not a single murmur of objection came from the men who flew the Ford.

The tough, phlegmatic Tri-Motor proved itself time and again. Stout used it to launch America's first regularly scheduled commercial airline—the Stout Air Service, serving Detroit, Chicago, Cleveland and Grand Rapids. In its initial year of operation, the Fords traveled 200,000 miles without an accident. Several pilots of the old Stout Air Service are now top executives of great American airlines.

Even under adverse conditions, when everything else was grounded, the Ford flew. Stout remembers the time when an

(Continued to page 222)

**Stout and Rex Williams, Arizona crop duster who now owns it, look over tail assembly of a venerable Ford**







## Portable Swimming Pool Can Be Erected in 30 Minutes

Next time you're invited to a dull party, you can brighten the evening considerably by bringing your own swimming pool. A portable swimming tank comes in a box 4 by 5 feet by 15 inches, weighs only 200 pounds disassembled, and can be put together by two men in a half hour. Five feet high, 13 feet across, it has a capacity of 4750 gallons and can be filled in one to four

hours. The walls consist of 10 lightweight aircraft-alloy aluminum sections held together with drop pins. The pool is lined with Vinylite plastic, which forms the bottom when it rests on the ground. Clear-plastic windows are built into two of the sections; at the bottom are small ports through which the tank can be lighted at night. A serving tray fits onto the rim of the pool.



## Tie Conceals Tiny Microphone Of Miniature Recording Device

Through a tiny microphone that can be secreted under a tie, recordings 2½ hours long can be made by what is described as the world's smallest recording device. The German-made gadget is known as a miniature magnetophone, or minifon. It is operated by two batteries and weighs slightly over two pounds.

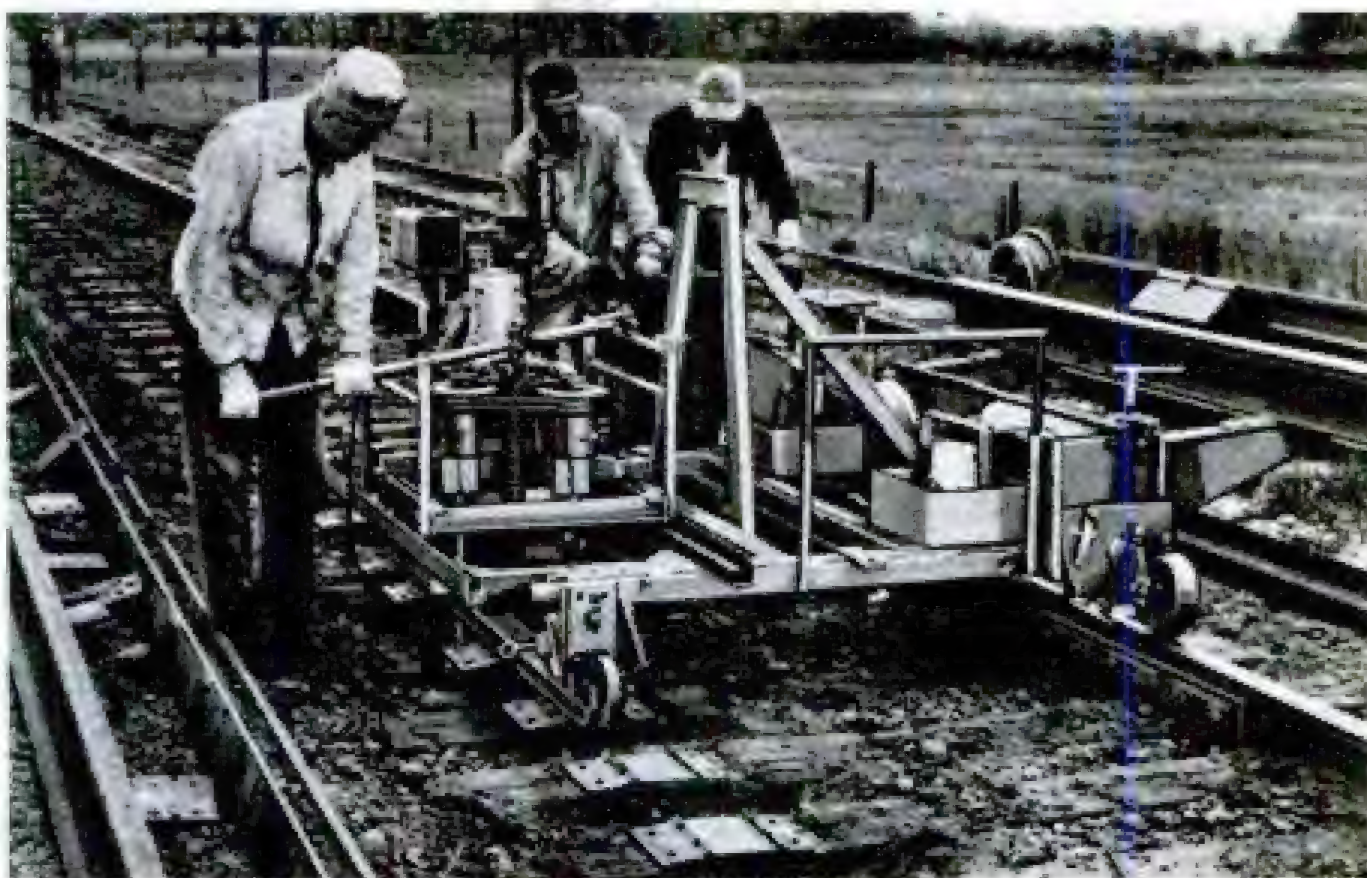
## Spark Plugs Cleaned in Engine

Motorists clean spark plugs right in the engine with an aluminum spacer that contains a small quantity of sand. The plug is removed from the engine and screwed into one end of the spacer which is then screwed into the engine. When the engine is started, the compression blasts the sand against the base of the plug cleaning it of accumulated deposits of carbon.

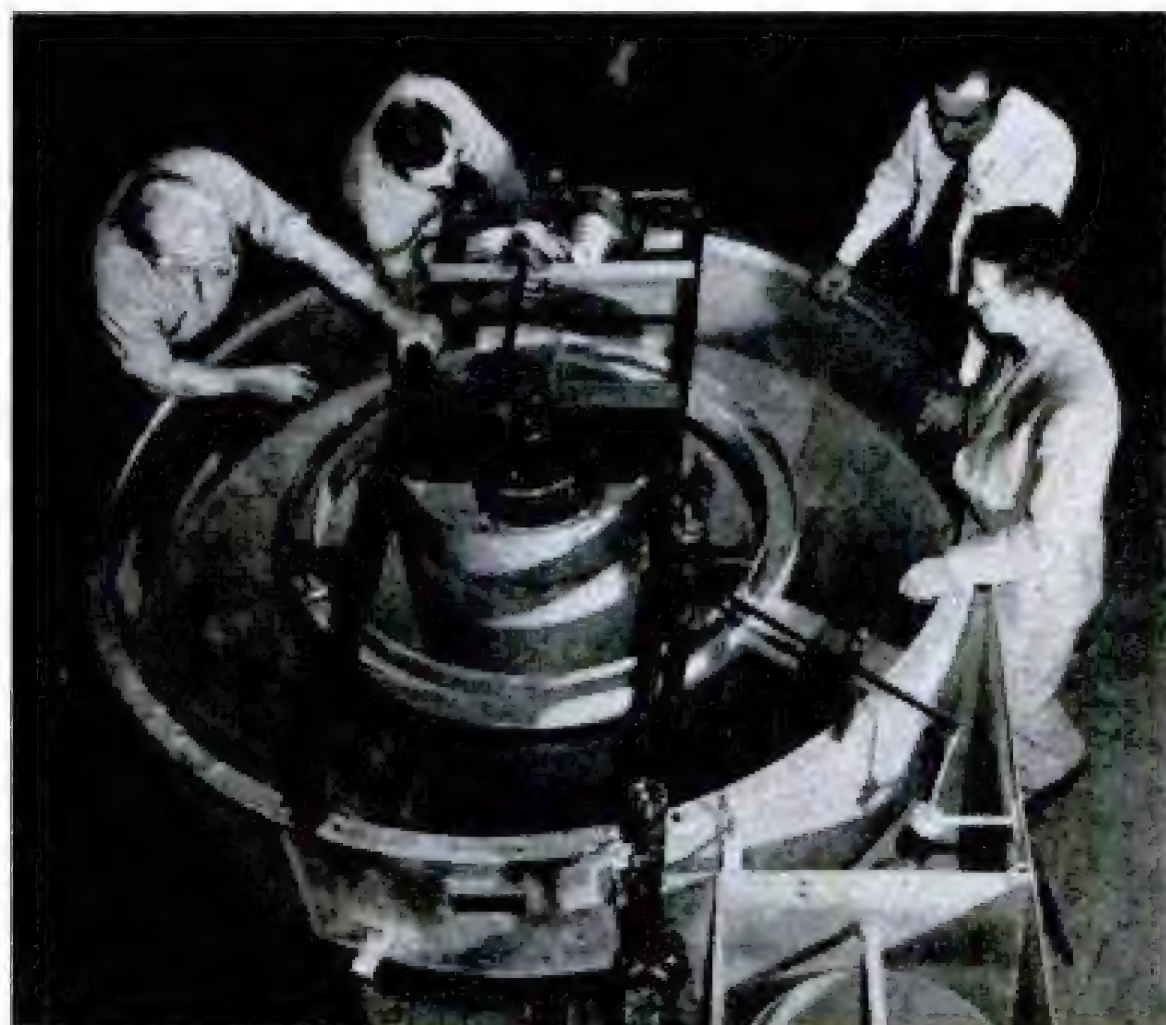


## Precision Gauging Machine Speeds Laying of Railroad Track

Clockwork precision in track maintenance results when railroad gangs work with a mechanized gauger. A gang of six or seven men can gauge from 70 to 110 rails per hour when the machine is used. First, tie plates are pregauged. The gauger, riding on a conical wheel on the rail already in place, then positions tie plates into accurate gauge. After positioning the tie plates, the machine drills two holes in the tie. Men following the unit drive wooden pegs into the holes to hold the plates in place until the rail is laid, bolted and spiked. The machine,



equipped with a spirit level, can be adjusted for width and inclination.



U. S. Army photo

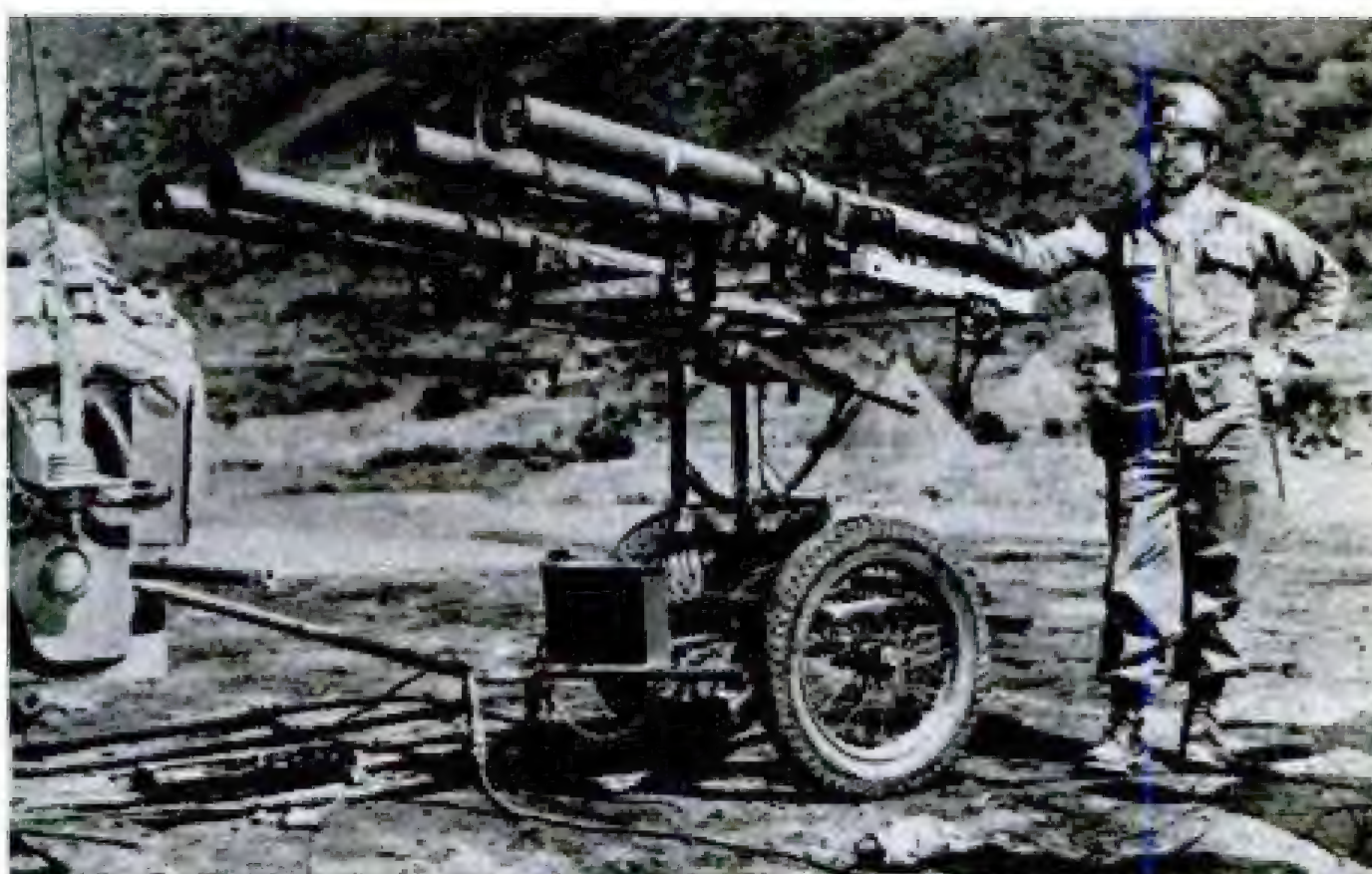
## Army Water Conditioner Mounted on Truck

Polluted water is purified at a rate of 3000 gallons per hour by a new truck-mounted unit developed by the Army. The purification unit can be transported in a cargo-type plane and operates in temperatures as low as 40 degrees below zero. The water is conditioned and filtered to remove silt, destroy bacteria and eliminate the organisms which cause dysentery and schistosomiasis, a serious water-borne disease found in the Far East. Polluted water can be pumped into the unit and discharged as potable water in 20 minutes. It contains its own power source and can be operated by one man.

## Bazooka Battery

Four bazookas mounted on a portable rig form a reservoir of effective firepower for an Army unit in Korea. Capt. Albert J. Barron devised the weapon, which can be trailed behind a Jeep or truck. In principle, it is similar to the multiple-tube rocket launchers now in use.

Latin America takes about 40 percent of all United States chemical exports.





***What goes on in that brief interval when your transcontinental train pauses for refreshment? It's groomed and inspected, restocked and washed from eyebrows to taillight. Here's what happens in that***



**Crew member, working on a split-second schedule, pours 350 gallons of water into a diesel unit. These units need water the same as steam locomotives, for each has a small steam boiler that helps heat the train**

# 10-Minute Service







Twelve-car train requires 2000 gallons of water for passenger cars, which have their own water systems

Mobile washer swishes down one side of the train, back on the other, scrubbing all windows during stop



# for a Streamliner

*By Thomas E. Stimson, Jr.*

**B**BETTER NOT go for a stroll when your streamlined train makes one of its infrequent stops!

There'll be barely time for you to look over the magazines at the station newsstand and climb aboard again before the train is on its way, picking up speed as it clears the yards. A modern streamliner hasn't any time to waste.

Yet a lot of things happen during one of these short halts. Your train is taken out of service, temporarily. It gets a thorough inspection and is given various safety tests. It is repaired if necessary, watered, refueled, washed and restocked with supplies. Then it goes back into service again with a new engine and a different crew aboard. Time: 10 minutes.

That's the way it goes at Albuquerque, one of the division points on the Santa Fe system. The Albuquerque inspection and servicing crew handles 12 transcontinental passenger streamliners every 24 hours, grooming each for the next 1000 miles or so of high-speed travel. During the stop, passengers are hardly aware that more than a dozen experts swarmed over their train, each doing a special job.

Inspection begins, actually, before the train comes to a halt. The car electrician squats down beside the track as the cars roll by. There's a flashlight in his hand after dark. He has a brief look at the wheel V-belt that drives the electric generator under each car. The generator supplies power to the battery that operates the car's lights, fans, drinking-water pumps, air conditioner and buzzer systems. He can tell at a glance if a belt needs replacement.

As a final check, the electrician makes his way from car to car after the train has stopped and opens the control compartment in each car for a visual inspection of the air-conditioning and heat-control apparatus.

Meanwhile other members of the inspection crew, who had been standing alongside the track, clamped a blue flag to each end of the train as soon as it stopped. The blue flags, or blue lamps at night, are a warning that the train is being serviced and may not be moved for any reason.

From service pits beside the track, the crew snake out fuel and water lines and attach them to openings in the side of each of the diesel units. The average high-speed train has four diesel-power units and about

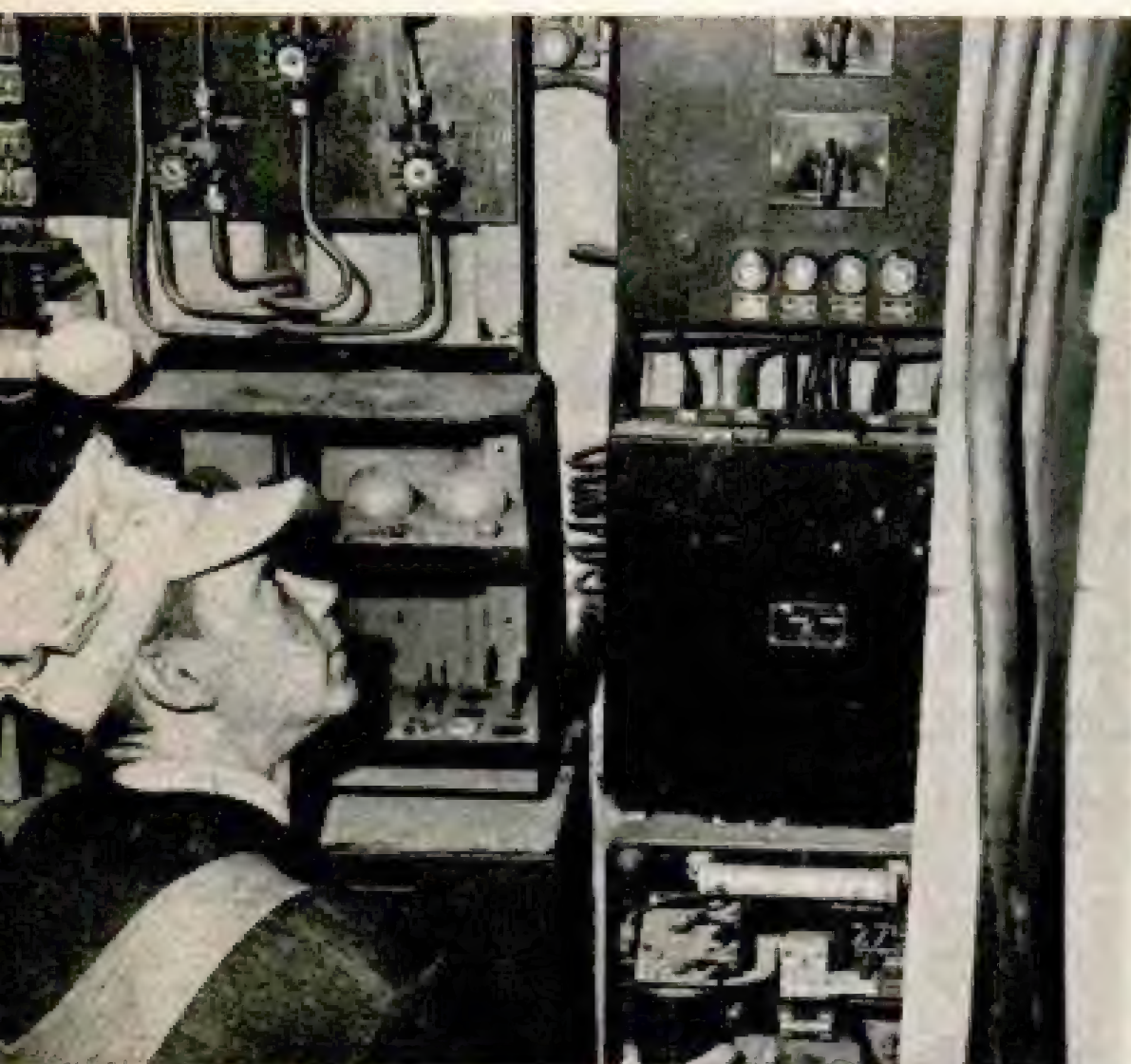




Logs of compressed sawdust (used in cooking ranges), ice and food are hustled aboard dining car while . . .



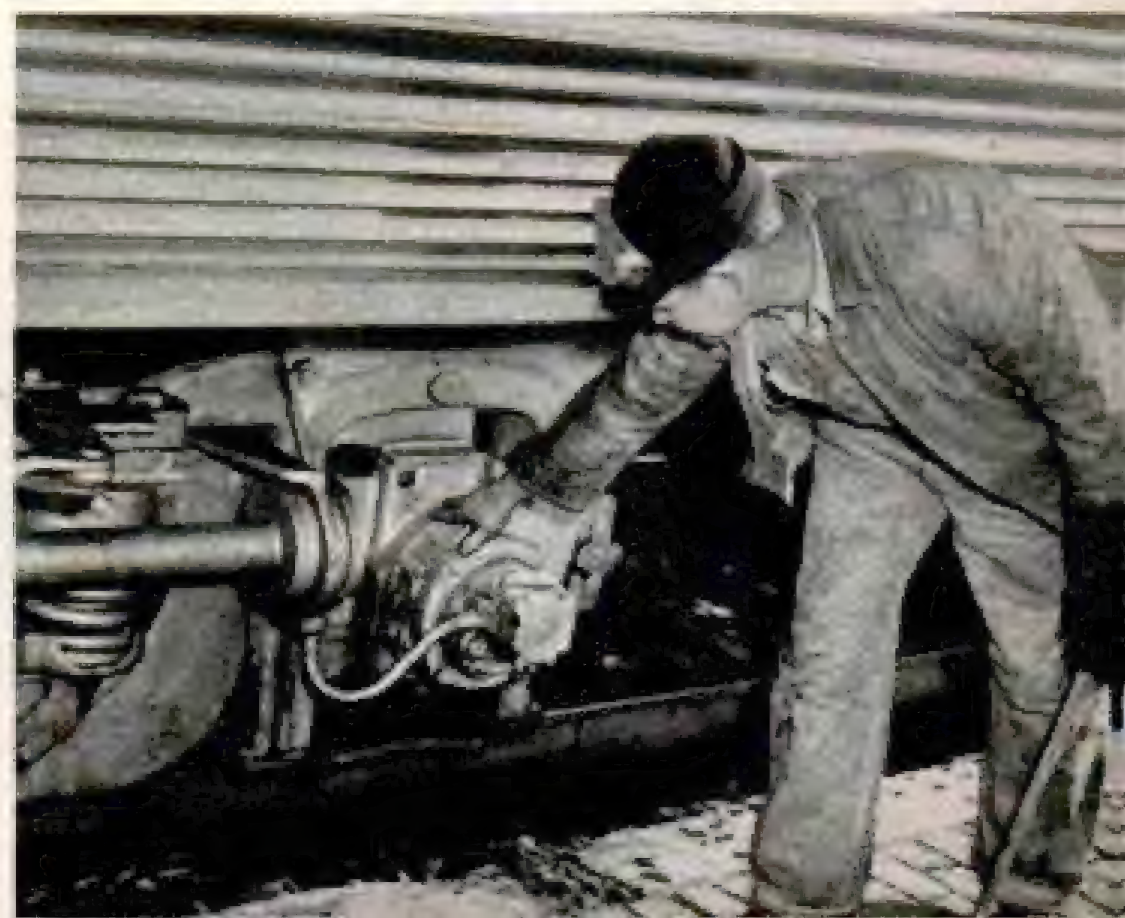
fuel for each diesel unit surges through high-pressure hoses. Each unit requires 600 gallons of fuel



Electrician swings aboard as soon as streamliner pulls in, unlocks and inspects each air-conditioning unit. Below, in winter, ice piles up beneath diesels. Here an inspector pulls off chunks to check valves



Meanwhile another crew member inspects valves of the air-conditioning systems, which blow off surplus steam while train is at rest. Below, temperature of wheel bearings is checked by feeling them with hand





a dozen cars. Each diesel unit gets some 600 gallons of fuel and 350 gallons of water at Albuquerque, the water being supplied to the automatic flash boilers that provide steam for heating the passenger cars.

Down along the train at the same time the diesels are being serviced, other men are plugging water lines into the side of each car, replenishing the separate water-supply systems. The passenger cars take a total of some 2000 gallons of water.

While the diesels are being serviced they are also inspected. The inspection crew walks through each unit, checking all fuses and automatic switches. The amount and quality of the crankcase oil in each of the two diesel engines in each unit is checked, as is operation of the automatic boilers. Switches and controls can be adjusted if necessary but no major repairs are made. An engine that appears to have a major malfunction is merely shut down. The loss of power from one engine unit alone will hardly be noticed by the engineer.

While all this is going on, a train inspector walks the length of the train, giving all the exterior running gear a thorough inspection. He taps the wheels and brake shoes with a "short bar" that he carries, listening to the ring of the metal. A brake shoe can be replaced in a couple of minutes if it is excessively worn and new brake shoes are lying alongside the track for that purpose.

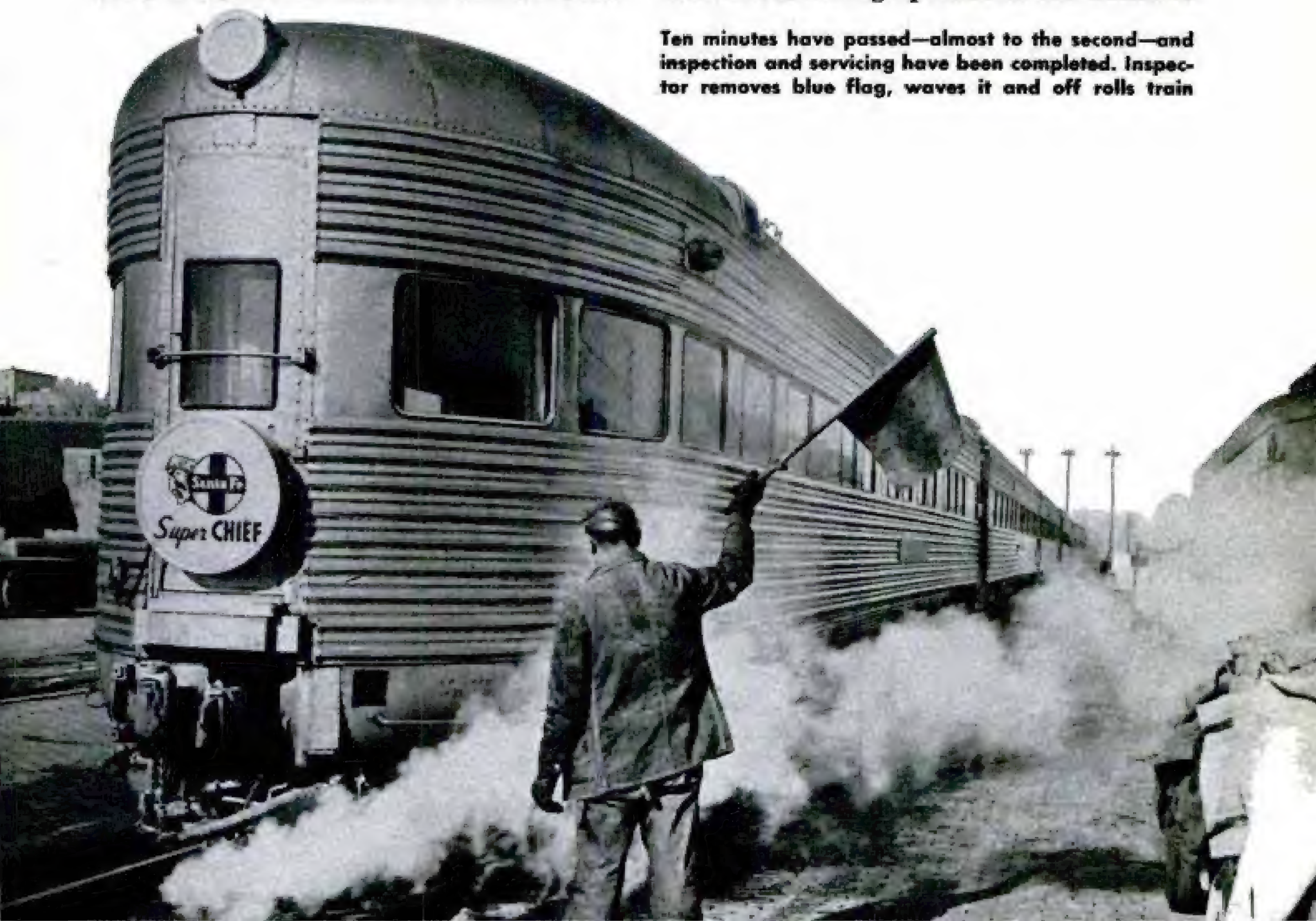


With an induction coil the inspectors check operation of the automatic-control device which stops the train if it should run through red signal in block system

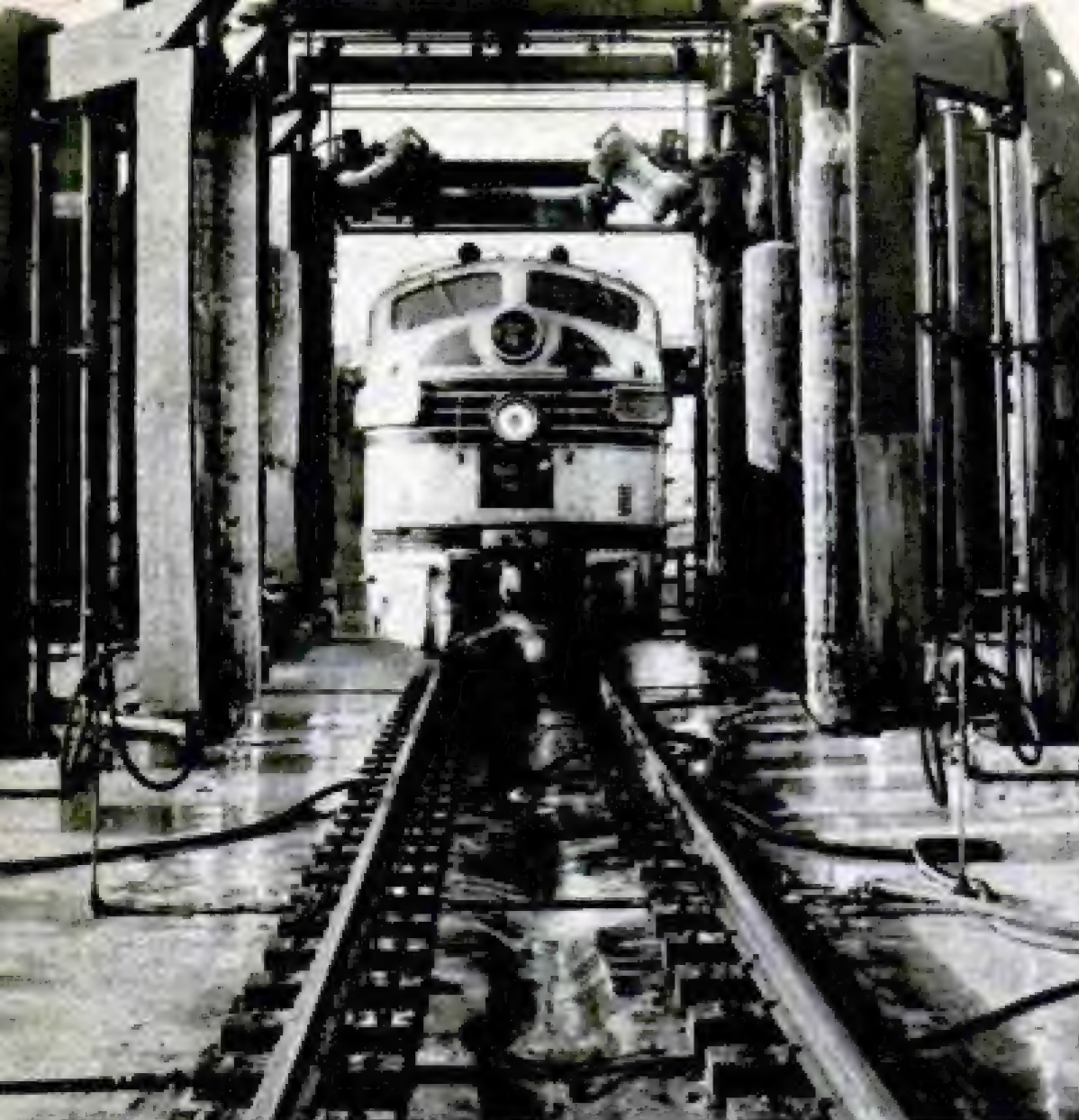
Each wheel bearing should feel slightly warm to the bare hand. If an inspector finds that a bearing is above normal temperature he reports the fact at once to his inspection chief. A hot bearing means that all passengers in that car will be transferred to other cars and the "hot" car will be left behind. This happens possibly once in five years.

Following the car inspector is the operator of a mobile window-washing vehicle who drives his rig up close to the windows

Ten minutes have passed—almost to the second—and inspection and servicing have been completed. Inspector removes blue flag, waves it and off rolls train





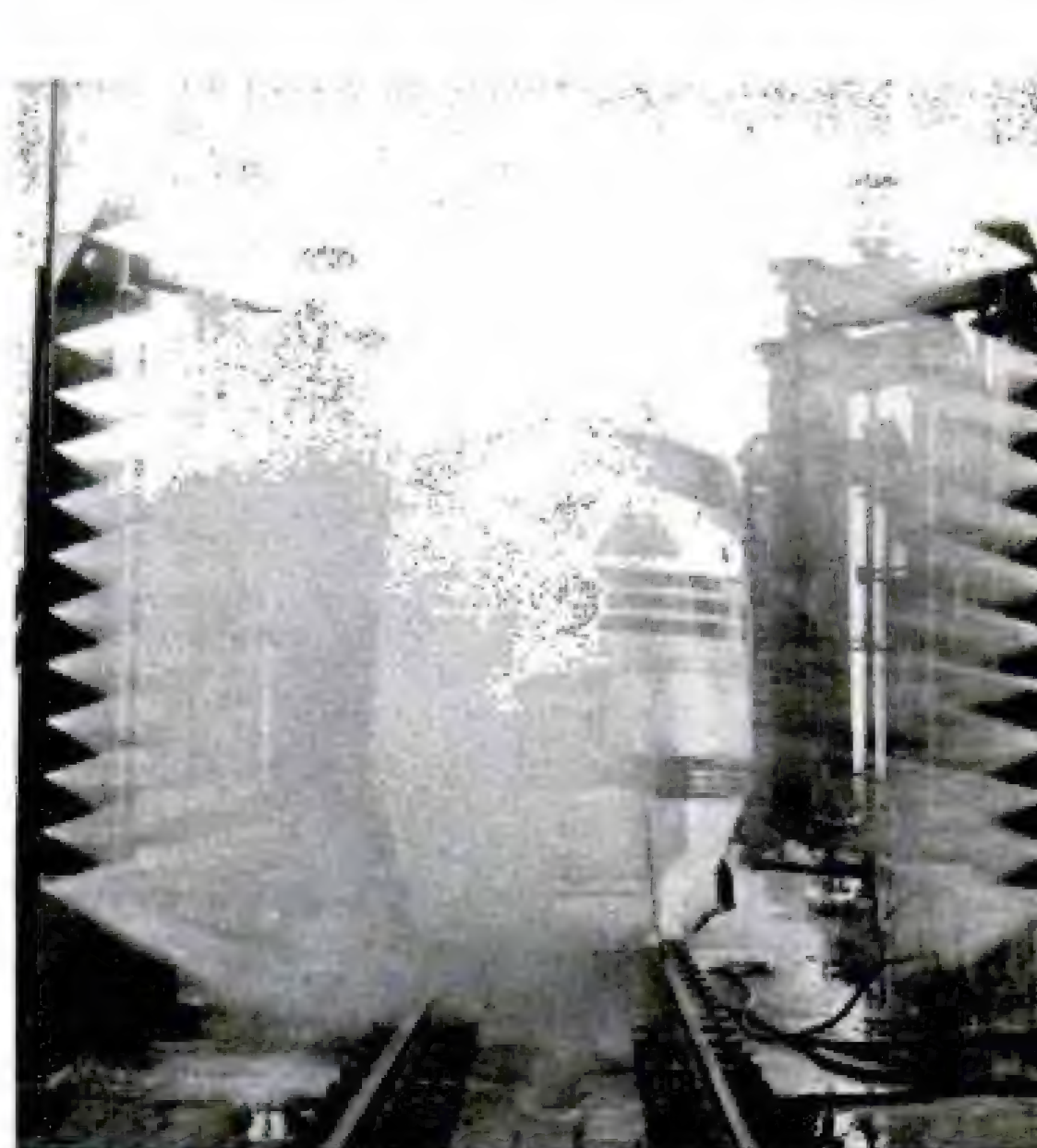


Locomotive of a Burlington Zephyr rolls through the wash rack. High-pressure jets of water and train-high brushes suddenly go into action. Moments later the locomotive rolls out, scrubbed sparkling clean

of each car, turns on his spray and the rotating brush, and gives the exterior of each window a thorough scrubbing.

Santa Fe streamliners normally stock up with enough food at the Chicago and Los Angeles terminals to last the full trip, yet occasionally a dining car may run short of such perishables as milk, pies or bread. A

Main purpose of a Vista Dome car is to give passengers a good view of the scenery, so it is important windows be kept clean. In this section of wash rack, brushes drop down to wash car's curved panes



telegram is dispatched to Albuquerque, in this case, from one of the stations along the line. The food is delivered on board at the time the rest of the servicing of these streamliners takes place.

Two kinds of ice, wet ice to cool the drinking water and Dry-Ice for refrigeration, are delivered to the diner. The cooks prefer logs of compressed sawdust to other fuels for their stoves; several arm loads of this wood are loaded on, as are additional supplies of charcoal for the broilers.

Soiled dining-car and lounge linen are discharged from the train and new supplies are taken on board. Linen for the Pullman cars is stocked for the full trip at either terminal. Four station employees in the meantime have been loading whatever mail and baggage are due to leave with the train and have been receiving any baggage and mail destined for Albuquerque.

There are still a couple of minutes left out of the scheduled 10-minute stop. The diesel inspectors use them to wind up their routine test of the automatic train control, a device that automatically stops the train if it should happen to run through a red block, and to complete their terminal air-brake test by which they make positive that the air brakes are working properly on each car.

By now the engineer, fireman, conductor and brakeman, who will operate the train to the next division point, have climbed aboard and the train running orders that are to be followed have been delivered to them. With all inspection and maintenance work completed, the blue signal flags are





Just before the train reaches Denver it makes a 14-minute trip through the long wash rack. Each car is laundered thoroughly with 530 gallons of water and the mechanical action of the huge vertical scrub brushes

removed from each end of the train, the engineer has another look at his watch and moves the train out.

Other rail lines handle their streamline trains in and out of the service and inspection points with similar dispatch. One unique service that the Burlington performs is to wash completely its daily California Zephyr when it stops at Denver, en route between Chicago and San Francisco. Train washing ordinarily is performed only between trips; the Zephyr gets an extra scrubbing along the way to keep spotless all the windows of its Vista Dome cars.

At Denver, the entire train goes right through the wash rack just before it pulls into the station. Most of the washing operation is performed by high-pressure jets of water and by enormous brushes that rotate against the sides of the cars. Similar overhead brushes clean the glass roofs and windows of the Vista Dome cars. A number of railroads are using or installing these wash racks.

The Zephyrs also receive a window washing after leaving the Moffatt Tunnel that crosses under the Continental Divide in Colorado. Dirt and dust that collect on the windows during the ride through the long tunnel are removed so passengers can enjoy the mountain scenery.

Not only do the streamliners receive streamlined servicing these days, they also receive similar streamlined inspection and servicing between trips. The railroads can't afford to let high-priced, luxury equipment sit idle in the yards.

An outstanding example of this is on Burlington's Chicago-Minneapolis run. Here the Twin Zephyr that arrives at Minneapolis at midday is cleaned, refueled, inspected, turned around, loaded with Chicago-bound passengers and started on its return trip all within 30 minutes of its arrival. Fast servicing like this permits the train to cover 974 miles per day at an average speed of 66 miles per hour, including station and terminal time. ★ ★ ★

## Carbon Ink Letters Glass

Lettering on glass and smooth plastics is possible with a carbon ink that has the covering power of India drawing ink and can be applied with a fountain pen. Tests show strong wear and heat stability and indicate that the ink trace is not flaked by repeated bending or rolling of the plastic. Its nonclogging qualities also suit it to general-purpose drawing.

## X Rays Inspect Canned Food

X rays are used to detect improperly filled cans of food as they race past on a conveyor at the rate of 900 per minute. The process, which will detect an under-filled or overfilled can within  $\frac{1}{64}$  inch, shoots a thin X-ray beam into the side of the can. If the beam gets through, it activates a unit which knocks the can off the conveyor line with a powerful air blast.





Model-builder Sigleer holds a completed cruiser of the Omaha class alongside the bare hull of a larger vessel in an early stage of construction. Below, the ship he is proudest of is the battleship *Missouri*. Photo shows the careful detailing of the battlewagon

# *Commander* **SIGLEER'S** **PRIVATE FLEET**

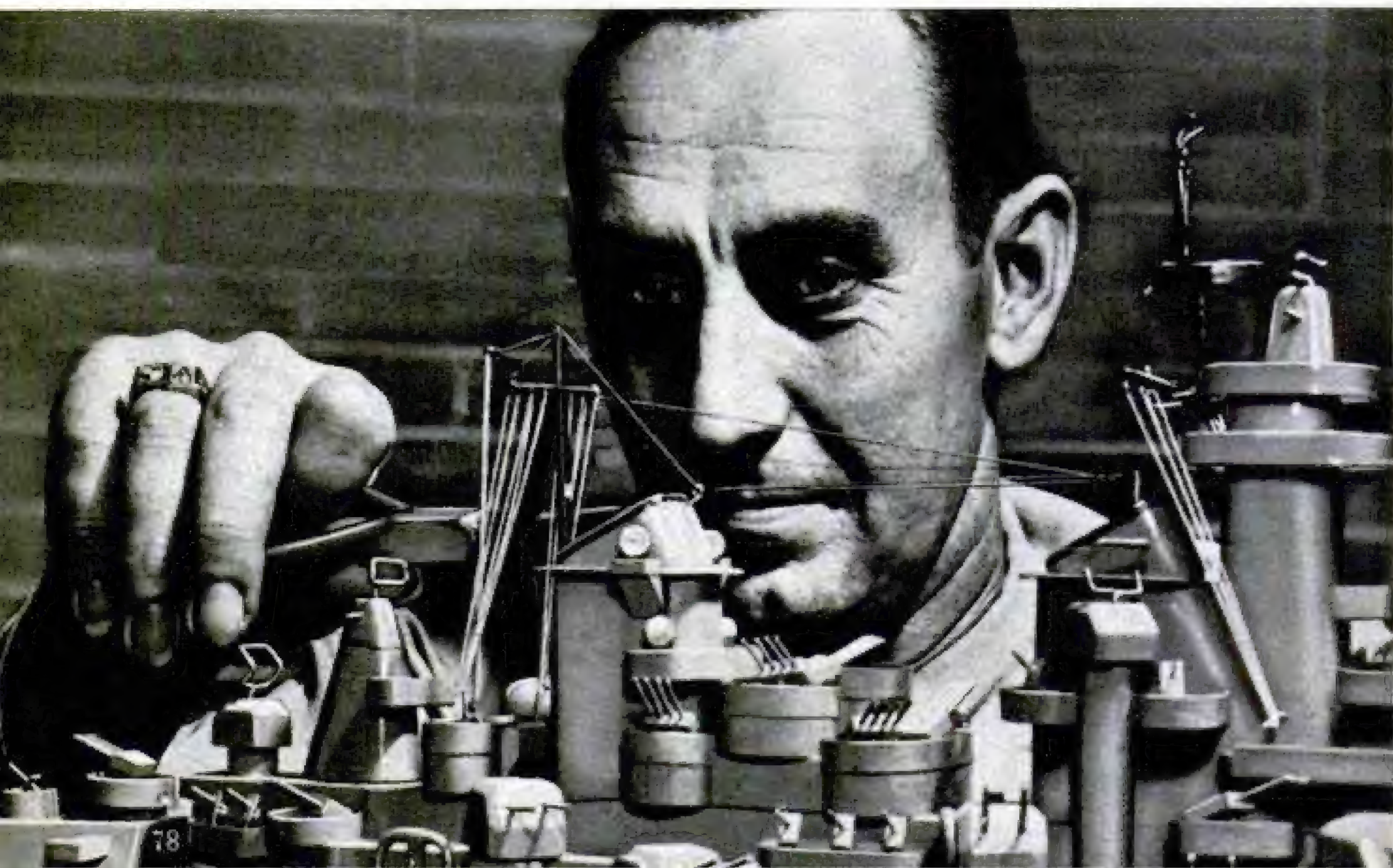
**I**T TOOK HIM 15 years, but Lt. Comdr. Harry L. Sigleer of the United States Navy now has a fleet of his own. And it's one that would please an admiral.

The fleet consists of 53 scale-model vessels, ranging from big aircraft carriers down to the small mine sweepers and landing craft. All are on a scale of one inch to 20 feet. Most are carved in sugar pine.

Such a hobby takes much more time than money and while at sea even commanders have time to spare. Materials used include thread, string, tape, cardboard, paper clips, pins and brass sheeting.

Queen of his fleet is a 42-inch model of the mighty battleship *Missouri*, built by Sigleer in 3½ months. It bristles with 181 guns and boasts radar antennas, paravane cables and catapult airplanes.

In three years, Commander Sigleer plans to retire from the Navy, but he'll still be on fleet duty—with his own fleet, that is. ★ ★ ★



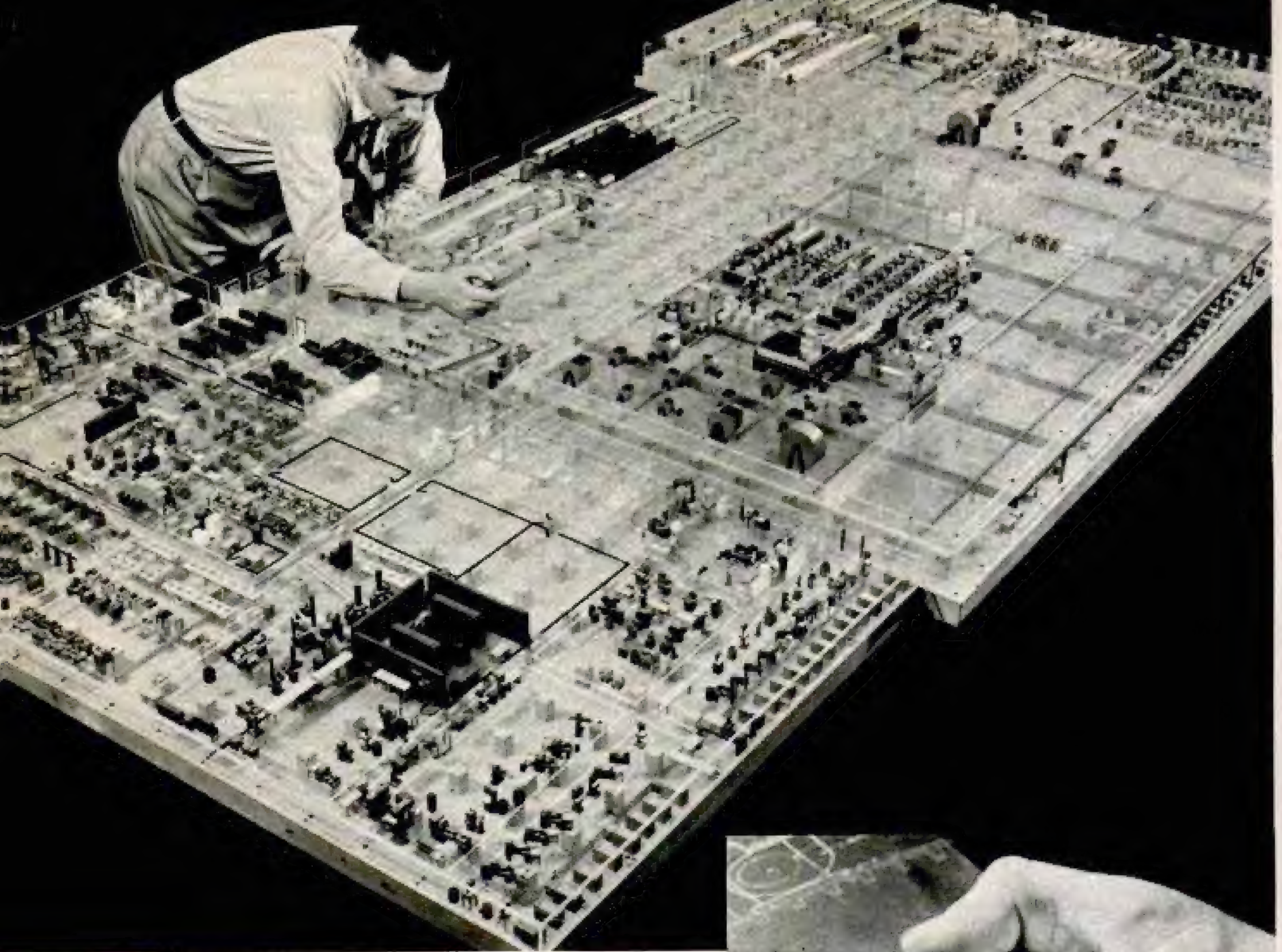




There are 53 scale models in Sigleer's private fleet. On display here are examples of the various types. He is holding a carrier of the Essex class. Also in the fleet are cruisers, submarines, landing craft, cargo ships and destroyer escorts. Below left, Sigleer installs an antiaircraft gun on a cargo ship. Right, a gun mount is added to a battleship of the South Dakota class. A battery of 16-inch guns is in foreground

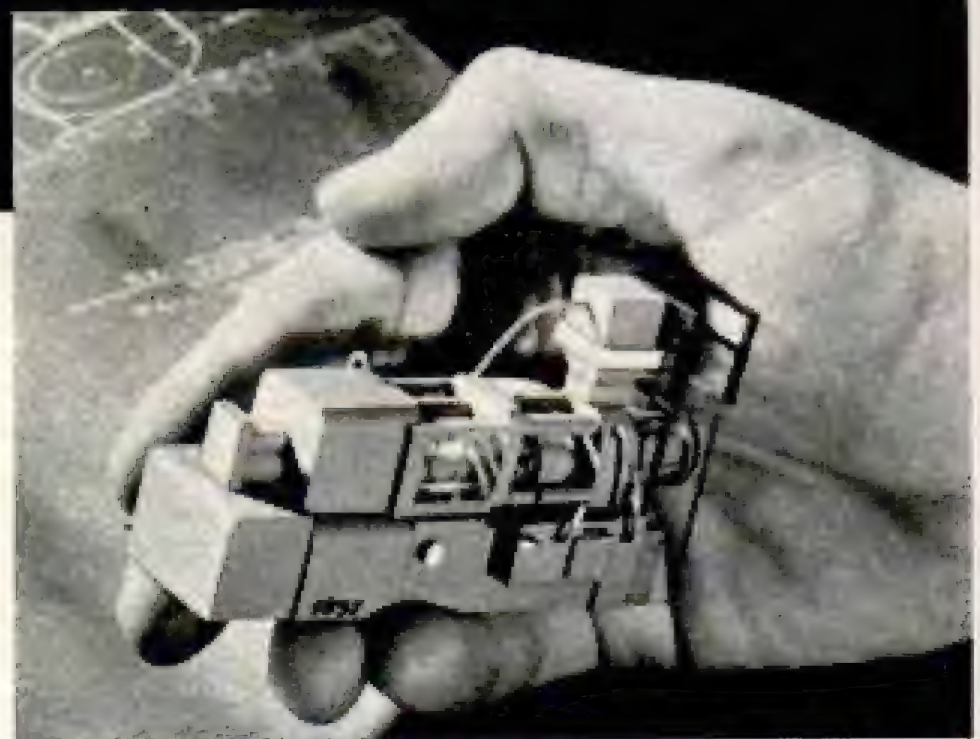






## "Toy" Machines Aid Planning At Fountain-Pen Factory

When engineers planned the installation of the new Parker Pen factory in Janesville, Wis., they were aided by a  $\frac{1}{48}$ -scale model of plant and equipment. Two thousand tiny replicas of pen and pencil-manufacturing equipment were carefully maneuvered to determine the best working positions. Transferring equipment from the old plant to the new without a decrease in production was one problem the engineers expected to solve with the 6 by 12-foot table model.



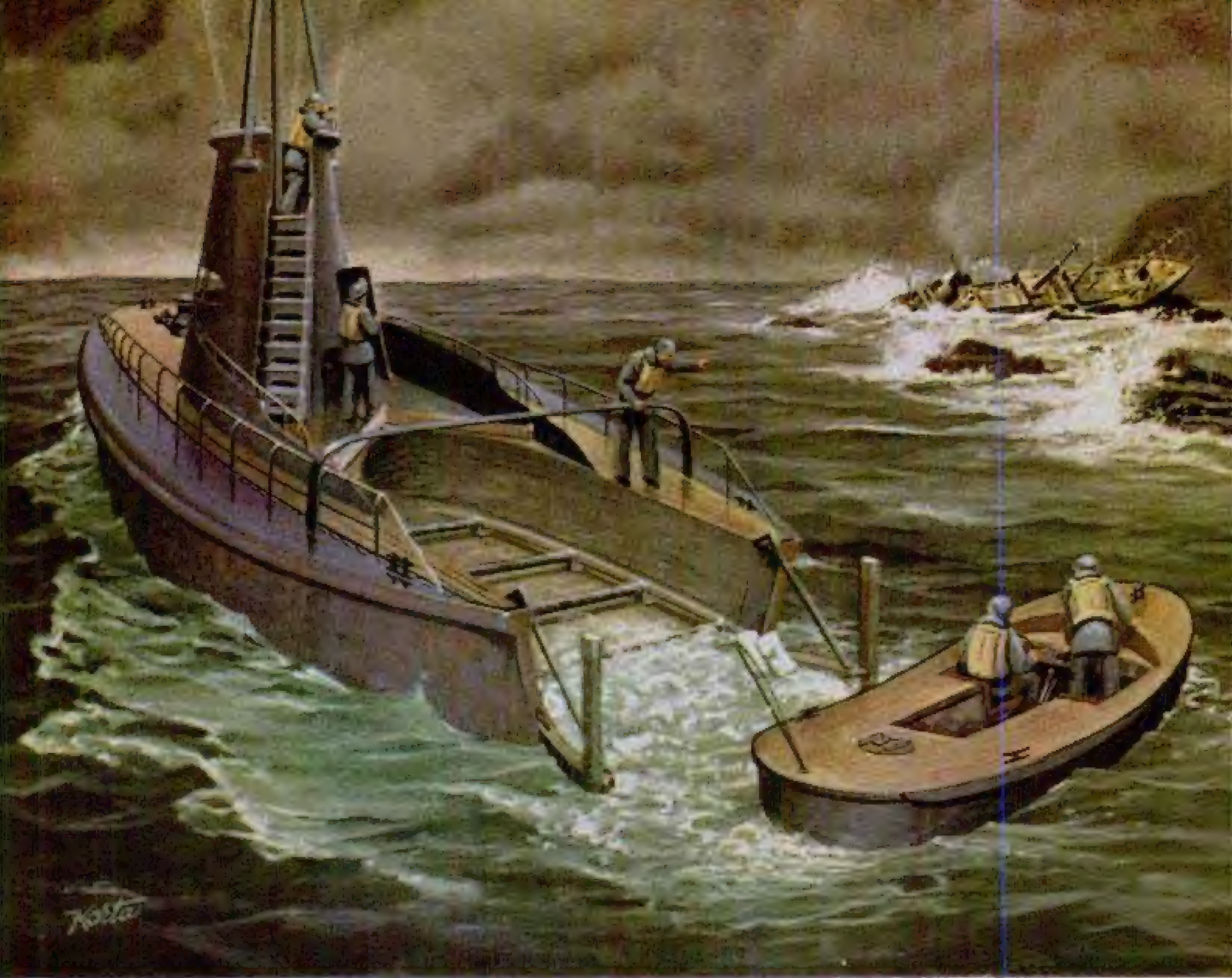
Machines working one day in the old plant were expected to be operating the next day in the new factory.



## Fluoroscope View of X-Ray Image Is Bright Enough for TV

Capable of brightening X-ray images 200 times, a fluoroscope viewer gives a movielike view of the body interior. The X rays strike a fluorescent screen and release light rays which pass through the screen and illuminate a photo-sensitive coating on the other side which emits electrons. The electrons are given a tremendous voltage boost as they leave the screen and strike a much smaller fluorescent screen which releases the flood of light rays viewed by the physician. Bright enough to be televised, the picture can permit diagnosis of internal ailments by physicians hundreds of miles away from the patient.





Small motorboat, launched from stern of rescue vessel, can cross dangerous shoals which bar mother ship

## GERMAN "KANGAROO" RESCUE SHIP

OFF THE GERMAN COAST a freighter breaks up on the rocks while an angry North Sea threatens to claim its crew at any moment. First on the scene is a schooner dispatched from a near-by coast-patrol station, a strange-looking vessel with superstructure like a submarine and a small motorboat nested in its stern. Its rear bulkhead slaps into the water. Two men jump into the smaller boat, which rolls smoothly into the sea and heads for the stranded vessel, passing over rocks that could tear the bottom out of the mother ship. Life lines are rigged, and the crew saved. The 37 by 15-foot "kangaroo" ship, the *Bremen*, was built for just such emergencies. Two 150-horsepower motors drive it at 20 knots; a 1200-horsepower motor takes over for rescue work and ice breaking. Sole air inlet is at the top of its high tower, out of the reach of high seas. The 19-foot "daughter" boat is driven at 12 knots by dual motors.

Lifesaving *Bremen* is operated by German Red Cross







Excited visitors joggle into town in coach after witnessing holdup no more'n a holler down Dry Gulch Trail

# The Frontier Lives

**By Richard F. Dempewolff**

*Color photos by Richard K. Dean*

**E**THAN ALLEN and his Green Mountain Boys would feel at home this year if they came back to haunt the woods near Fort Ticonderoga, where they once made history fighting the Redcoats. In a clearing near North Hudson, N. Y., there's a genuine hand-hewn log village that looks like a drawing from an old book. The manned blockhouse, log schoolhouse, church and smithy buzz with colonial activity. The village potter twirls his wheel and the forge rings to the smithy's hammer. Cabins are occupied by frontiersmen and their wives, busy at the rugged chores of pioneer living. Women in Mother Hubbard dresses card wool and spin it on their wheels. There's the clatter of ancient hand looms weaving fabrics.

Outside, men in leather jerkins clean muzzle-loading muskets or cut wood on an ingenious saw turned by a horse on a creaking old treadmill.

Mail is carried in and out of town in Pony-Express saddlebags. Stagecoaches laden with travelers rattle along near-by roads. Lawbreakers (they have them here) get their just deserts in the pillory or stocks. Or they may be sentenced to three dips on the ducking stool that hovers above the pond in the center of the village.

Ride the old Concord Coach through the forest, into the clearing where this cluster of log buildings nestles against its Adirondack Mountain backdrop, and you step back 200 years in history.

Nevertheless, Frontier Town (its official





† Captured, the desperado is locked in the pillory awaiting trial. The village isn't just a museum—all the equipment is put to work to add to the fun of the visitors

Right, Pony Express rider gallops past, snagging a packet of letters mailed in Frontier Town. He is a real postal employee who totes mail to a near-by post office



Below, convicted desperado strapped to the ducking stool, is given three dips in the town pool as punishment. It's all part of an action-packed show given every hour or so

# Again

Photo by George Bolster







Here's the robbery scene that startles the visitors. Later during the trial, several visitors—usually children—are called on to act as witnesses



Benson has roamed the countryside to find authentic furnishings for the town buildings. Here's a hand-shuttle loom that not only works, but turns out cloth for the homespun clothing of the actors. Below, covered wagon stands ready to make long haul west with frontier family



name on the map) is far from ancient. It's the spanking-new brainchild of Arthur L. Benson, a Staten Island Norseman who, until two years ago, was an installation man for a telephone company. Benson was browsing through the reconstructed colonial towns and plantations between Virginia and Florida during a recent vacation trip. "They were like museums," he says. "Everything was on exhibit but you couldn't touch the stuff, and nothing worked."

Why not build an authentic colonial village, full of colonial equipment, plus people who could make the village really work?

"For instance, the idea of having a ducking stool that would work tickled me," he recalls. "That meant my village had to be in New England where those things were used to punish witches in the early 1700s."

He toured New England, quizzing gas-station attendants and store proprietors in quest of the right location. Thirty miles from historic Ticonderoga he found it. Visiting among the local people, he came across Jim Liberty — a 67-year-old logger who as a youth followed the timber camps from Penobscot to Tillamook. Jim had built bunkhouses for the timber men, using nature's raw materials, an ax, an adz and sweat—just the way his forebears had done. What he didn't know about making log cabins wasn't worth knowing.

With a crew of 10 men, old Jim Liberty went to work. From surrounding woods he and his boys selected tall, straight balsam and pine trees at least nine inches across the butt. They felled them with axes, as the pioneers did, peeled the bark with big spoon-shaped spuds. Within a year 10 log buildings squatted in the clearing—a church of unpeeled cedar logs, a schoolhouse, a rugged blockhouse, assorted cabins



and shops used for village maintenance.

Collecting all the things that went to make an early pioneer village work was no easy job. Benson scoured the countryside, digging in barns and attics, pleading and cajoling aged farmers into parting with ancient equipment. His Concord Coach, an old Western stage, and a John Stevenson coach were bought at auctions and hauled into Frontier Town for refurbishing by an aged coachmaker.

He bought and rejuvenated a horse treadmill used by pioneers to power a saw. Another discovery was a dog treadmill that activates a rocker arm that spins a paddle back and forth in a tub. Old-timers made the dog work to wash clothes or churn butter. Today it churns again in Frontier Town.

Once the town was equipped, Benson turned to finding people who could man his village like true pioneers and make his antique gadgets work. A Benson relative who had carded wool in the old country came up and gave lessons. A schoolteacher from near-by Schroon became the village potter. Old Jim Liberty stayed on to attend building and expanding the village. Sixty-six-year-old Willy Bryan, who drove the last stage between Westport, on Lake Champlain, and Lake Placid until it went out of business in 1912, is in charge of the village rolling stock.

Visitors are part of an active show that follows a leisurely cycle every hour or so. It starts with a stage ride through the country for anyone who wants to pay the extra fee. On every trip out, Willy Bryan drives

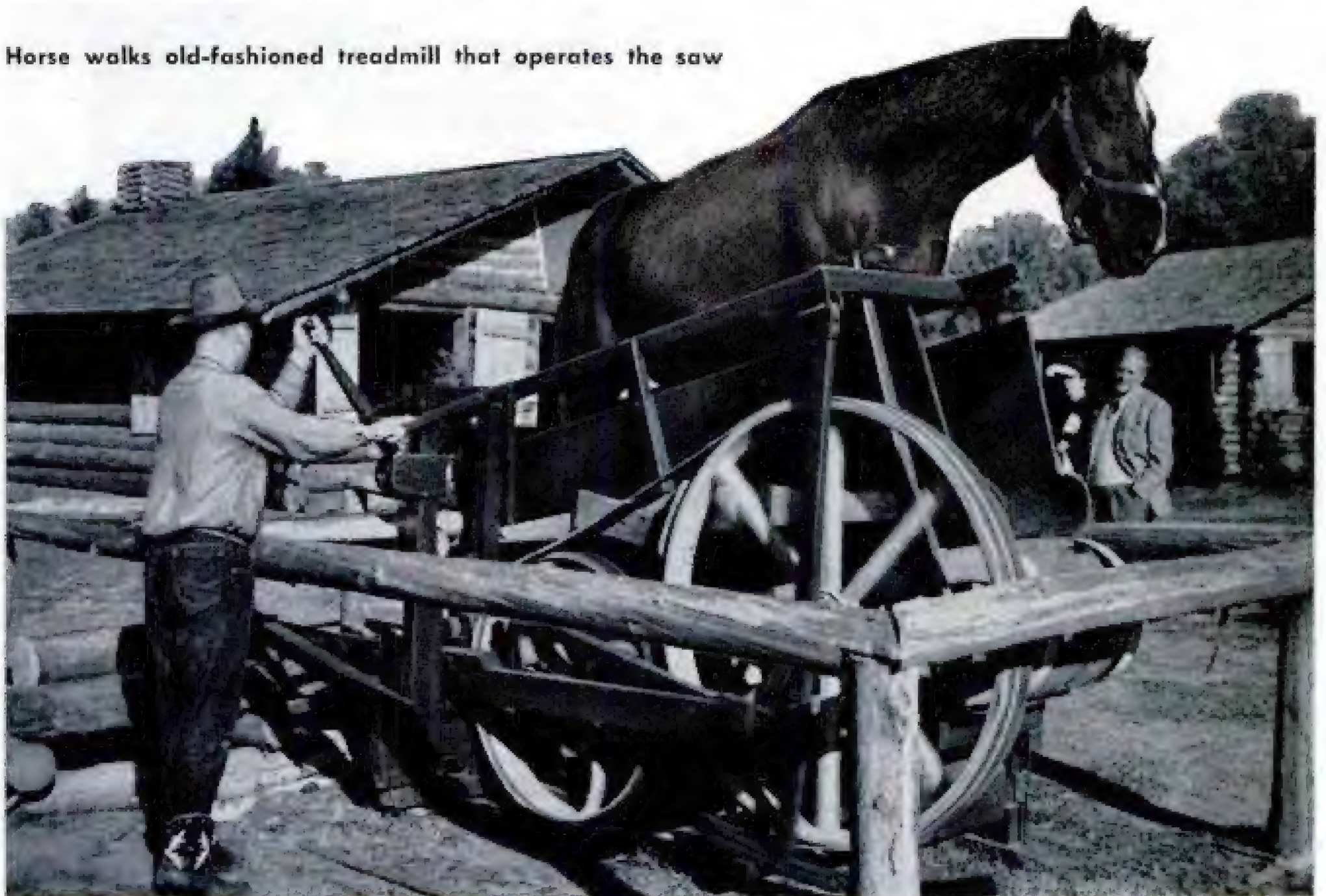
his load of travelers through a deep ravine where a robber on horseback charges from the bushes, six-shooter banging away, holds up the stage, snatches a bag of "gold" from the driver's seat and makes off with it. The coach clatters back to town where the robbery is reported. Later, the robber is caught by the sheriff and the man may be sentenced to three dips on the ducking stool—a chair tied to the end of a long, hinged beam which can be rocked in and out of the pond like a big seesaw.

The major difference between this colonial village and most other reconstructed historic tourist meccas is Benson's insistence that every piece of ancient equipment must be operative—and put to use by his hired villagers in just the way the old-timers used it. Instead of browsing through a colonial cabin and looking at rows of candle molds on shelves, the visitor watches a pioneer wife actually making candles—which are used when they're made. The horse treadmill produces wood for the big fireplaces where iron kettles on ancient cranes are often simmering. Products from the spinning wheels and looms can and do turn out homespun clothes for the actors in the town.

The idea is paying off, too. Late last summer the village opened for the first time. Although it was far from complete, some 70,000 people streamed through the unique town to join the fun.

Benson plans to keep things popping on Ethan Allen's old stamping grounds. ★ ★ ★

Horse walks old-fashioned treadmill that operates the saw







## Two-Piece Plastic Speedboat Requires Minimum of Upkeep

Made of molded glass fiber, there are just two parts to a new 14-foot water runabout—top and bottom. The reinforced plastic boat has molded seats and deck, a recessed

motor well and a sweeping flange that forms a spray rail. A smaller version for fishermen is 12 feet long, has a 50-inch beam and 3 thwart seats.

## Lightweight Shield Protects Fire Fighters

Allowing a fire fighter to work within two feet of hot flames, a portable glass-fiber shield offers protection from searing radiant heat. A blanket of glass-fiber insulation, mounted on a tubular frame, forms the effective barrier. The unit gives protection from the front and side and permits firemen to direct hose crews or turn off valves. Easily carried on the run, the shield weighs only 26 pounds. The resilient glass-fiber blanket is held with copper-wire mesh.



## Portable Beach Pen Keeps Children Safe While Parents Swim



Anchored in the sand, a portable beach pen for small children keeps them safe while parents swim. Bright-green cloth net forms the four sides. Posts driven into the ground at the corners are held firm by taut rope braces connected to tent pins stuck in the sand. Rolled into a tiny bundle, the portable pen can be carried in one hand and takes little storage space in car trunk, trailer or apartment.

Information not listed on articles in the index often is listed in the WHERE-TO-FIND-IT LIST, available at no cost from the Bureau of Information, *Popular Mechanics*, 200 E. Ontario, Chicago 11



Only a few feet from the ground, Scherb uses small scintillometer to check a "hot spot" that showed on big unit at 50 feet



By Michael Day

*The quest for oil has taken an amazing turn—to the sky! Scientists have discovered mysterious atomic "halos" that pin-point oil pools deep in the earth and can be spotted from a helicopter*

# NOW THEY'RE HUNTING OIL WITH ATOMIC "GUNS"

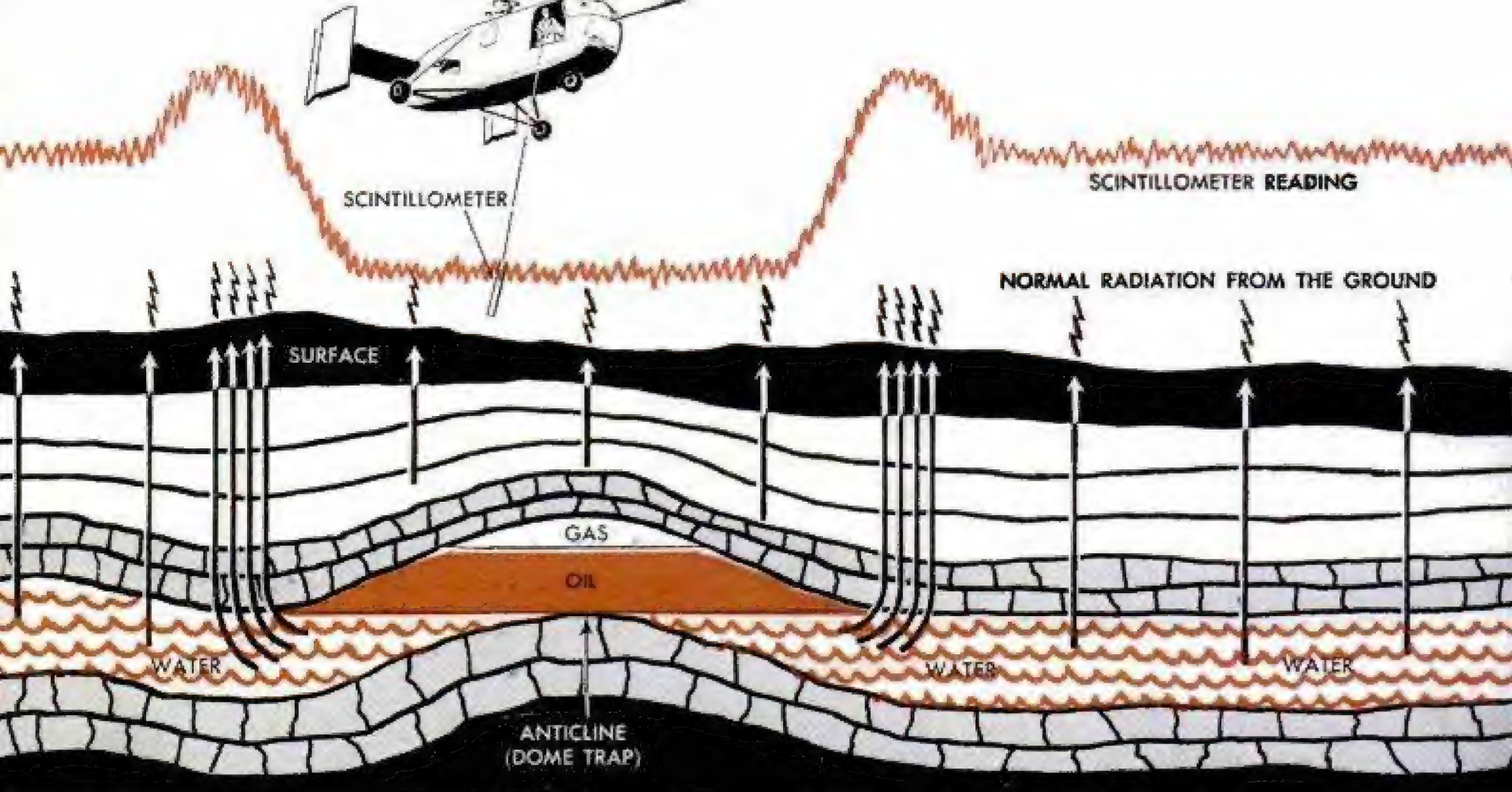
**H**OVERING no more than five feet off the ground, a weird craft moved slowly across a stretch of desolate Eastern countryside recently. A quick look might have tagged it as a helicopter—but no helicopter ever looked like this thing. Instead of tail boom and torque propeller, a conventional airplane-tail assembly with twin rudders brought the rear of the chunky cabin to an abrupt end. Above the cab, a pair of 48-foot rotors, one atop the other, beat the air in opposing directions like big contrarotating choppers. At the controls, a crash-helmeted pilot guided his charge this way and that, sometimes standing stock-still, sometimes creeping ahead.

A passenger at the open side acted no less strangely than the machine. Earphones spanned his cranium. With one hand he adjusted a cable, from which dangled a long cylinder sweeping a few feet above the ground as they went. His other hand

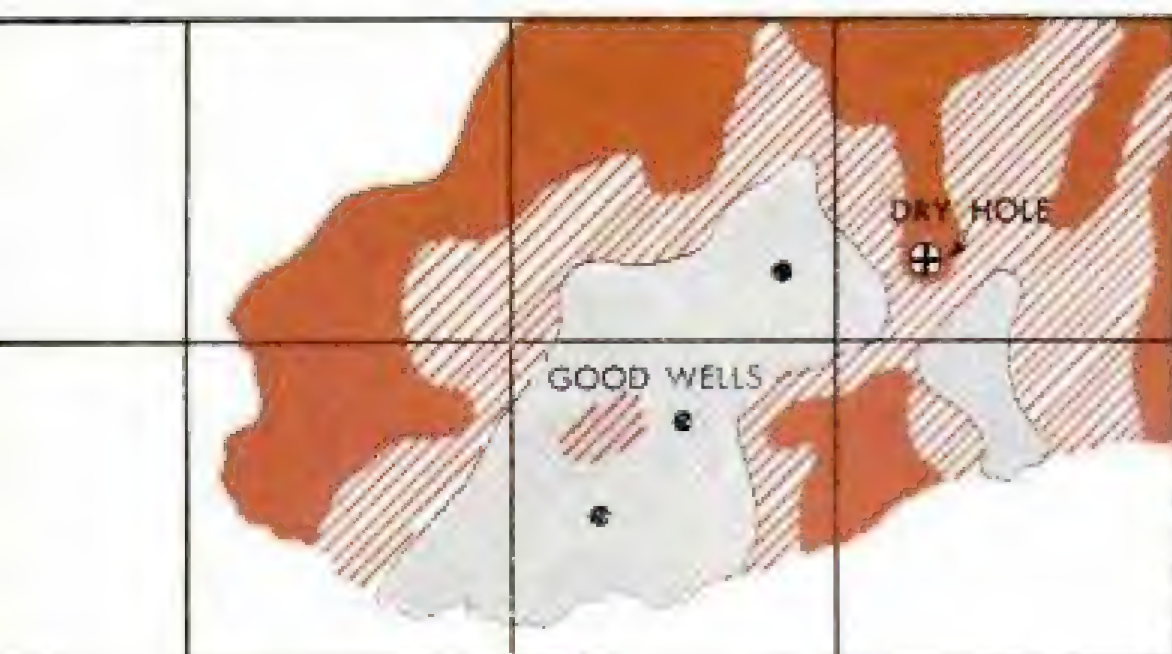
Surface checker registers radiation on meter that emits crackling noises







Red graph line indicates scintillometer reading. Radiation is low over oil pools, high at edges



Radioactivity survey made of actual oil field shows good wells within radioactive "halo," dry hole at edge

Soil sample from field is placed on tiny metal disk and shoved into "castle" which measures beta rays



clutched the pistol grip of a gleaming aluminum object—reminiscent of a Buck Rogers atom-ray gun—which he pointed toward the earth.

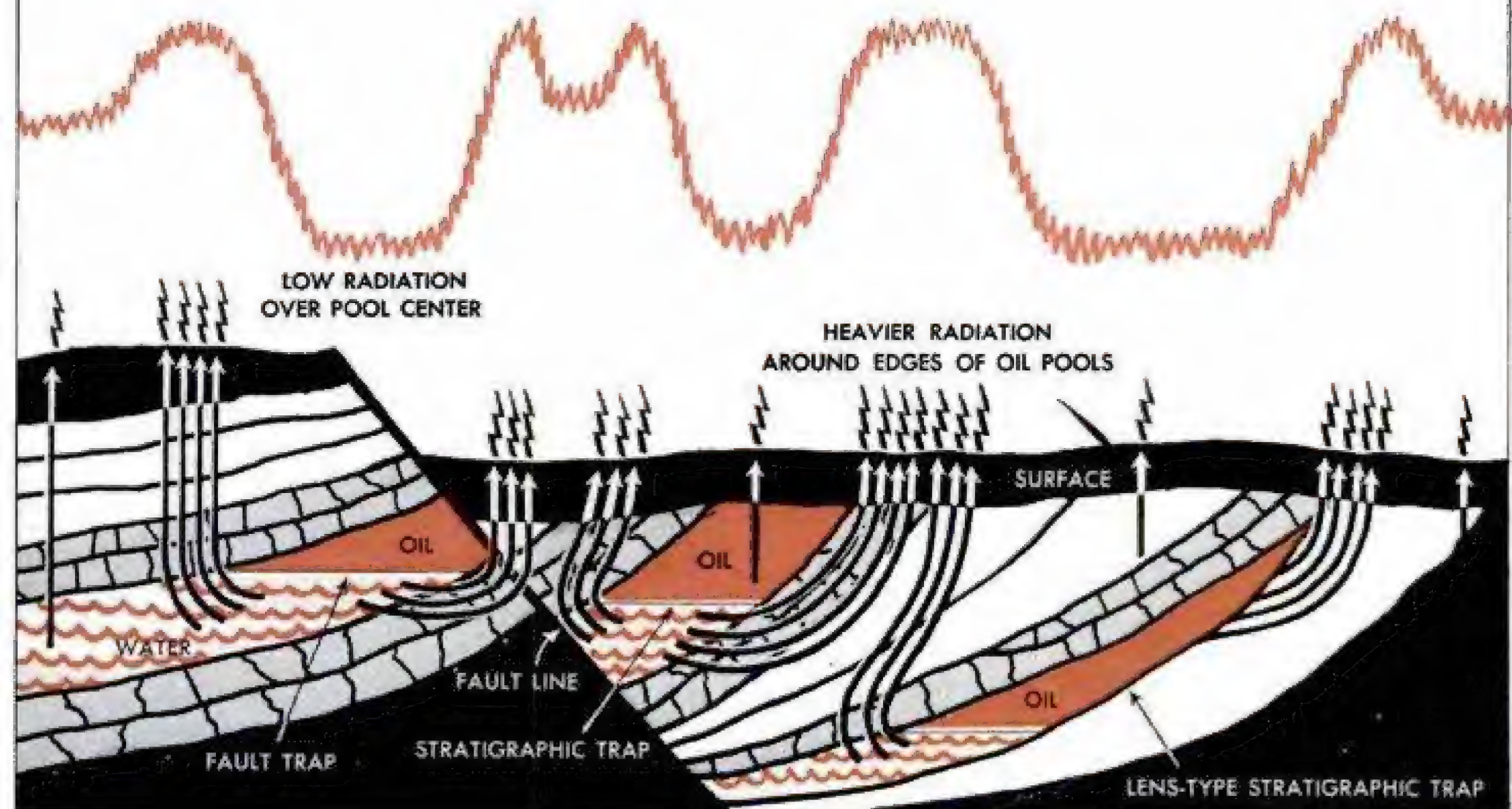
A casual observer might have thought he was either dreaming or watching a streamlined flying farmer on the prowl for groundhogs. Actually, he was seeing in action a combination of new tools—from Gyrodyne's fantastic coaxial helicopter to the latest in atomic-detection instruments—that show exciting promise of slashing the element of chance in oil exploration. Under the atomic eyes of an array of new supersensitive instruments searching from the air, the ground, and even underground, hidden subterranean oil pools are now being detected via the giveaway static of nuclear bombardment that seems to surge from the earth around edges of oil traps.

Until now, oil prospectors have had to rely largely on seismic research to steer them to black gold. Shock waves from surface explosions penetrate the earth's crust, bounce off different layers of rock and echo back to the surface. By timing the echoes, the explorer gets a picture of subsurface structure. If he finds domeshape wrinkles, he may find oil. Or, he may not.

Magnetometer as well as gravity-meter surveys are other methods of oil hunting. These involve flying or carrying instruments over the ground to determine the magnetic effect and gravity pull of various subterranean layers, and then calculating the structure. If it looks promising, it might (or might not) yield oil.

All these methods are fine for locating exciting underground formations. But just because the traps are there doesn't guar-





antee that the oil is, too. What's worse, none of these systems can help the geologist when oil may be right under his feet in a formation known as a stratigraphic trap—such as an upward-sloping series of sediments, sliced off near the surface and sealed by flat, impervious surface rock.

"Only the bit proves the presence of oil" has always been a favorite remark among oilmen. And you can't blame them when you know that all but 13 percent of the oil wells drilled today are dry holes—sunk at an average cost of about \$100,000 per, even after extensive surveys. Only three percent of wildcat locations come in.

The new atomic method, however, seems to detect radiation associated with oil itself. Actually, there is a certain amount of radiation everywhere. Cosmic particles shoot in on us like rain from outer space all the time. And uranium, found in small amounts everywhere in the earth, shoots particles upward in a fairly steady barrage. It's when this steady barrage of "background noise" increases or slows that something unusual may be indicated. Geophysicists first noticed such changes in oil territory about 10 years ago. Bruno Pontecorvo, a former Italian nuclear physicist, devised a nuclear counter in 1942 which he dropped into wells that were being drilled. The changes in radiation count as the instrument descended helped indicate type of strata through which the bit was chewing. Today, such counters are widely used in "logging" wells. Other geophysicists using similar instruments noticed something else: when they lugged their counters on the surface, across edges of known oil fields in operation, the crackling

Hand scintillometer for ground surveys registers nuclear bombardment on dial at base of instrument







Scintillometer is suspended by cable so it can skim along close to ground and pick up only direct radiation

of atomic particles piercing the Geiger tubes behaved oddly. Above the steady background of cosmic particles and the normal radiation from the earth were a few additional crackles, or pulses, that had no business there. And in some places there were less than there should have been. The men couldn't prove much except that these microscopic variations existed. Their Geiger-type instruments were too insensitive, so little came of the discovery.

Recently, however, the whole picture changed when a group of Westinghouse and Princeton University scientists — followed by a Canadian group and many others — hunched over their laboratory tables and came up with a new kind of supersensitive radiation detector called a scintillation counter. What makes it better than a Geiger? If atomic rays are present near a Geiger counter, some of the particles pierce the tube, excite a gas, and set up an electrical discharge that is heard as a static-like crackle or registered on a meter. But only a few particles are powerful enough to be heard; many go through uncounted. The scintillation counter is based on a crystal that fluoresces, or glows faintly, under bombardment from flying atomic particles. The glow is picked up by a photomultiplier tube where it sets off whole showers of photoelectrons which, in turn, trigger secondary electron showers in a sort of chain reaction. These electron showers can be highly amplified, so that even the weaker particles that hit the crystal make a big enough splash to be detected.

80 RICHMOND W. TORONTO,  
With this supersensitive counter, a number of geophysicists, including Hans Lundberg, president of Lundberg Explorations, Ltd., in Canada, flew crisscross patterns over known oil territory. What they found set off a buzz of excitement in oil circles. Lundberg reported that as he flew over the center of known oil fields, his airborne scintillation counter registered a radioactive "low." But around the fringes of the underground oil pools, atomic particles rocketed up from the earth to produce what he calls a "halo" of increased radioactivity.

Back home, Lundberg plotted his readings on maps of the areas over which he had flown. Out came a series of contour lines in a saucer-shaped pattern of radioactivity. Those high readings seemed to encircle the areas where producing wells gushed their best.

Outside the saucer's rim were the dry holes. Some poor oil wells sat in places that showed up under the scintillation counter's atomic eye as fringe areas. Coincidence? Lundberg set out to see. In one year he flew his crackling instruments over Canadian oil territories for 800 hours — 100,000 miles of tedious recording. Flying at 100 to 500 feet, and at 100 to 175 miles per hour, his results were good enough to heighten cautious optimism.

Exciting as it seems, geophysicists are saying little. Teams of experts all over the country are busy combing the skies and ground to test the new theory. One of these pioneer groups is the geonuclear division of the Radiac Co., in New York City.





Checking influence of cosmic radiation, Scherb places "gun" on lead shield to block radiation from ground

Recently, Dr. M. V. Scherb, director of the division, and M. M. Reiss, the company's general manager, invited representatives of *Popular Mechanics* to accompany an experimental-survey team that was making airborne, ground and laboratory investigations of radioactivity patterns over a large area of Eastern land. A fantastic array of Radiac instruments went along, including odd-shaped scintillation counters and Geiger counters.

The new coaxial helicopter, hot from its experimental hangar at the Gyrodyne Company's testing grounds in St. James, L. I., was hauled out especially for the job. Its stacked rotors, eliminating need for a torque prop, give it what test pilot Jim Ryan calls "easy symmetrical control."

"You don't have to make half a dozen corrections for every move," he explains. "She's stable as a rock in any position and any altitude."

Unlike most helicopters that are flying at touchy "critical altitude" at anything under 50 feet, this big five-man "chopper" can hover on a dime—or move steadily in any direction—at just two feet above the ground. "It's ideal for this type of work," explains Reiss, formerly with the Air Force and a Manhattan Project officer.

While Jim Ryan warmed up the chopper, Scherb loaded two scintillometers—one, the portable aluminum-encased outfit with pistol grip; the other a long tubular instrument on a cable. A new supersensitive Geiger counter went aboard, along



Instruments inside helicopter show radiation picked up by trailing detector, here retracted before take-off

with an array of dial-studded amplifiers.

With a roar, the helicopter rose to a height of about 50 feet and the big scintillometer went over the side. "It's lead-shielded to keep out cosmic rays from space," Scherb explained. "The tube is open at the bottom to allow the crystal to pick up rays emanating from the ground."

The system, described by the nuclear physicist, is simple but tedious. A grid pattern is flown across a suspected oil area in a series of parallel lines at right angles to each other and about 300 feet apart. If you drew a picture looking down on the craft's course from above, it would look like lines on a piece of graph paper. Every few seconds radioactivity readings are logged. If an interesting change in nuclear count pops up on the dials or in the physicist's crackling earphones, he may signal the pilot for a closer look. Down goes the helicopter; the hand scintillometer is poked over the side while the pilot hovers a foot or two above the ground. This closer examination may verify the unusual reading, or prove that the craft merely ran through a sudden shower of cosmic particles from outer space. Underneath the helicopter's belly, a long super-Geiger tube is triple-checking the nuclear counts.

After the air survey, the geophysicist grids the surface of the same ground by Jeep or on foot. Tramping across the fields, clutching the pistol grip of his scintillometer in one hand, and listening to the crackle

(Continued to page 250)



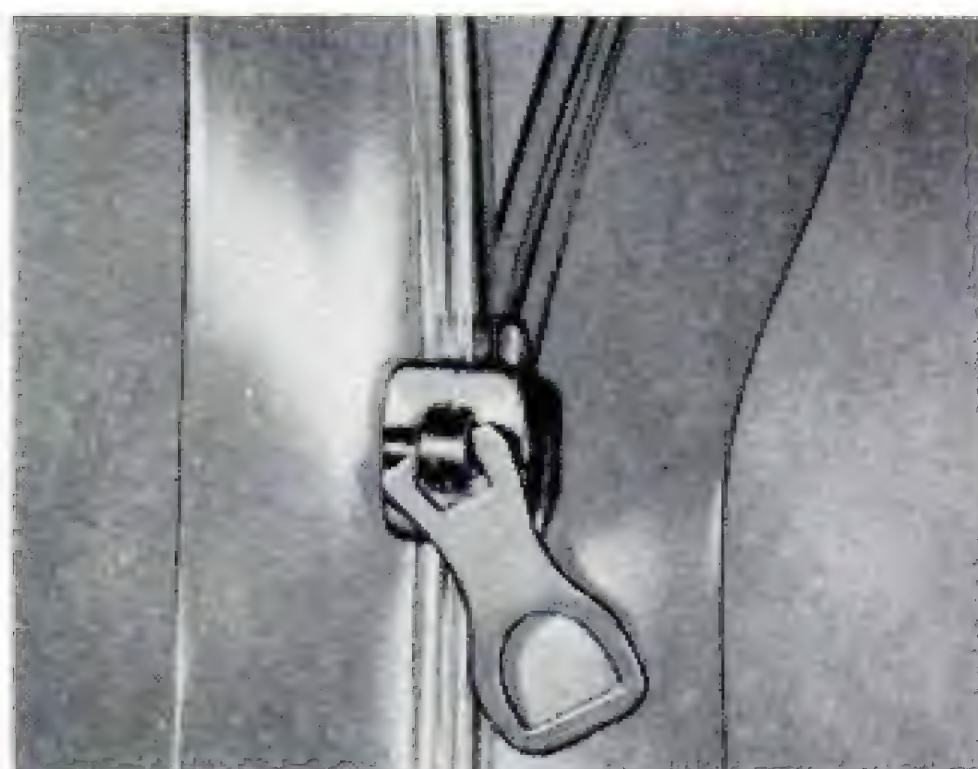
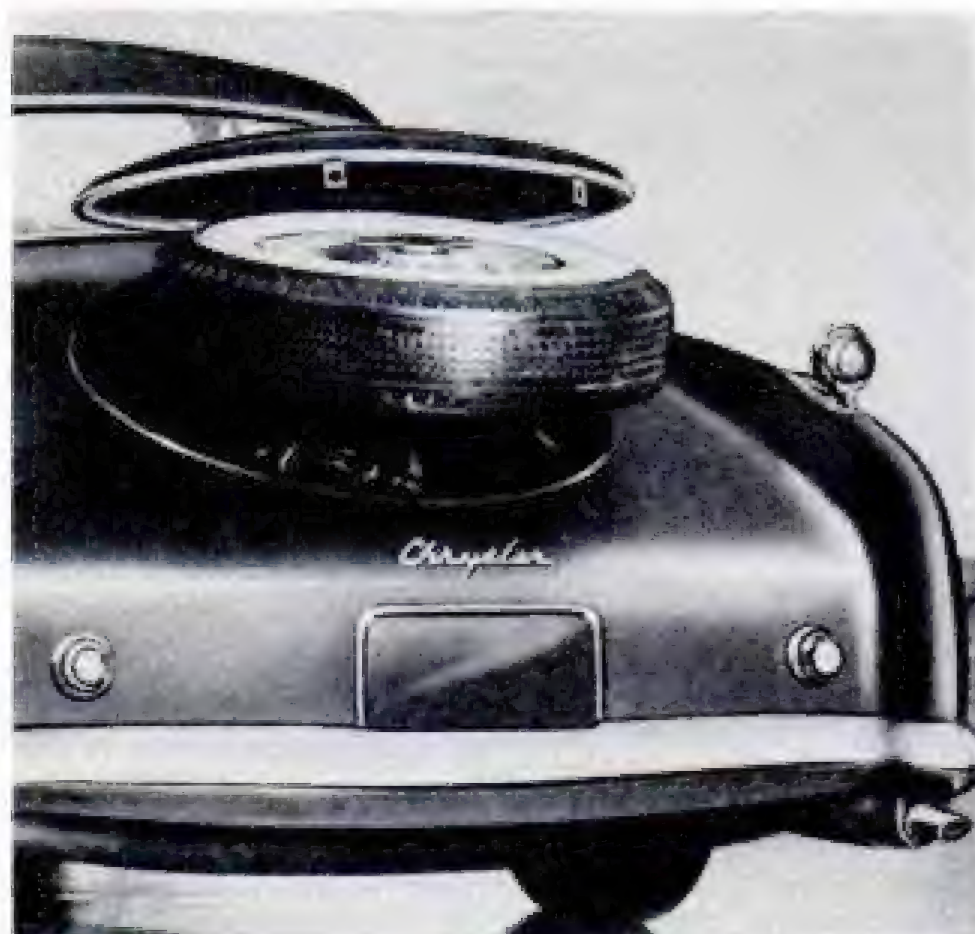


With uncovered wheels and a long, low hood line, the Chrysler D'Elegance is in the European tradition

## Chrysler's D'Elegance Has Pop-Up Spare Tire

That messy chore of unloading the spare tire when you have a flat has been refined in Chrysler's advanced-style automobile, D'Elegance. All you do is push a button and the spare tire and its protective cover are automatically lifted from their place inside the rear deck. The tire then moves rearward and down to stop just behind the rear bumper where you easily remove it. Nothing has been done to put the spare wheel on the axle—you still have to do that for yourself. The new car is not destined for the production line. It uses standard Chrysler parts and stands only 54½ inches high. Recessed headlights and downward-sloping long hood are in the European tradition; however, it was designed by Chrysler's engineers in the United States.

Un-European is the spare tire, however. Push a button and it pops up, then it swings down for easy removal



## Plastic Toothless "Zipper" Makes Watertight Closure

Resembling a metal Zipper, a new all-plastic fastener has a slide mechanism instead of teeth to close interlocking strips. It is being used as a closure for plastic pillowcases, blanket covers, wallets, brief cases and raincoats. One edge of the material to be closed has grooves resembling parallel ruts in a dirt road, the other has ridges similar to the runners of a sled, and the fastener presses them tightly together. The toothless fastener is also available in metal, nylon or several other plastics.



# What's Happening in TV Around the World

**By Elliott H. McCleary**

WITH THE POMP of ages, the procession from Buckingham Palace wends its way along the streets of London to Westminster Abbey. There a new sovereign of the British Empire receives her crown—as millions watch.

And countless others, scattered all over the earth, also watch the coronation within a few hours, for TV at last is spreading 'round the world.

In a Paris cafe, a businessman watching a live telecast sees an ermined peer step forward. Outside a Brussels television shop, Belgian school children shout as prancing horses draw a gilded coach past their eyes.

Across England, Scotland and Ireland the microwaves flash their pictures.

Within hours, films of the coronation appear on the picture tubes of 23,000 receivers in Rio de Janeiro. Tokyo citizens watch the rites on their American-made sets, and a station in West Berlin hurls microwaves through the Iron Curtain to give a handful of East Berliners a view of the most widely televised event in history.

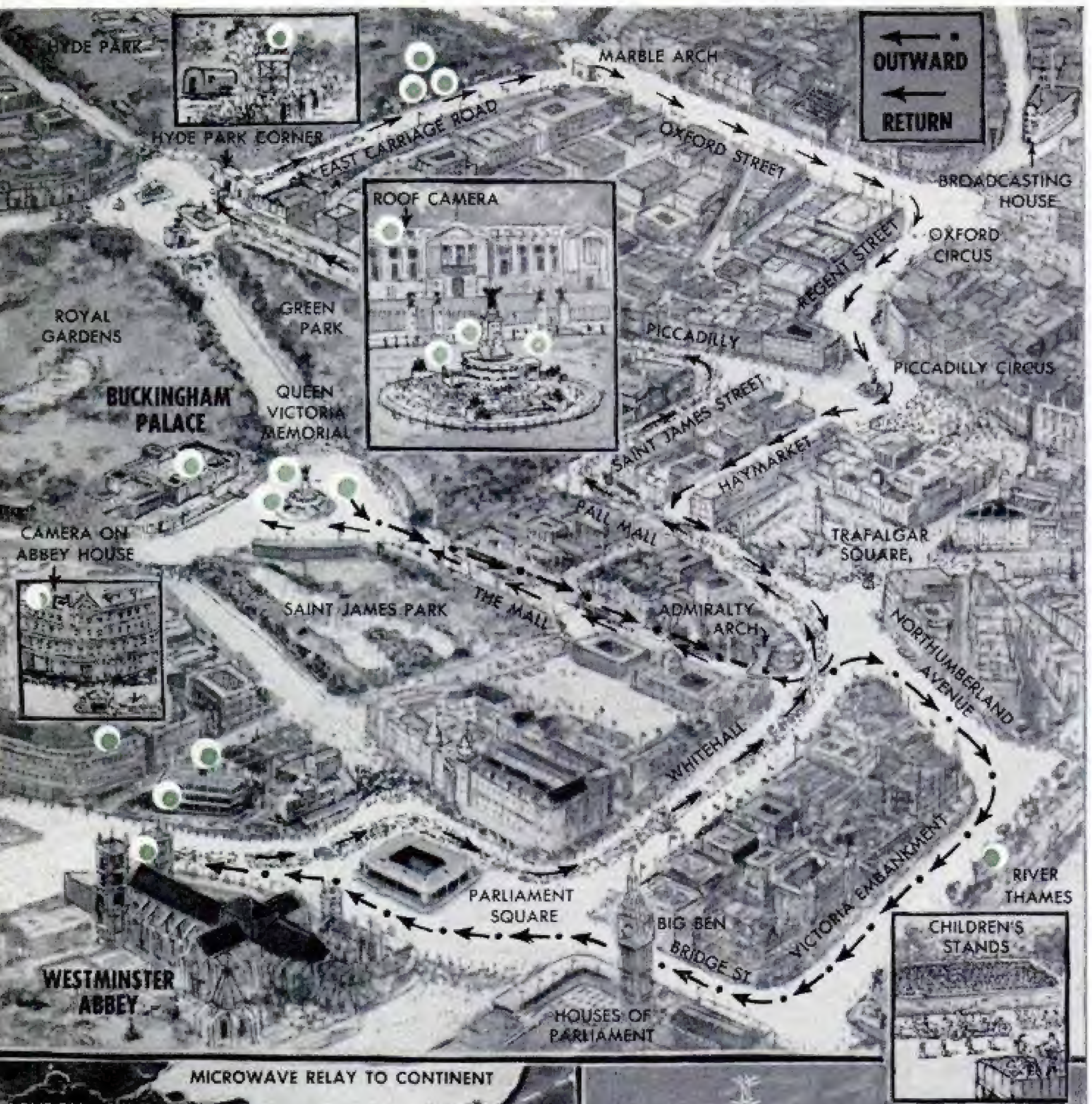
In Moscow, Milan and Mexico City, the television age has begun. TV abroad is still

Another national sport goes on TV as camera picks up bullfight in Mexico. Below, Berlin TV "on location"

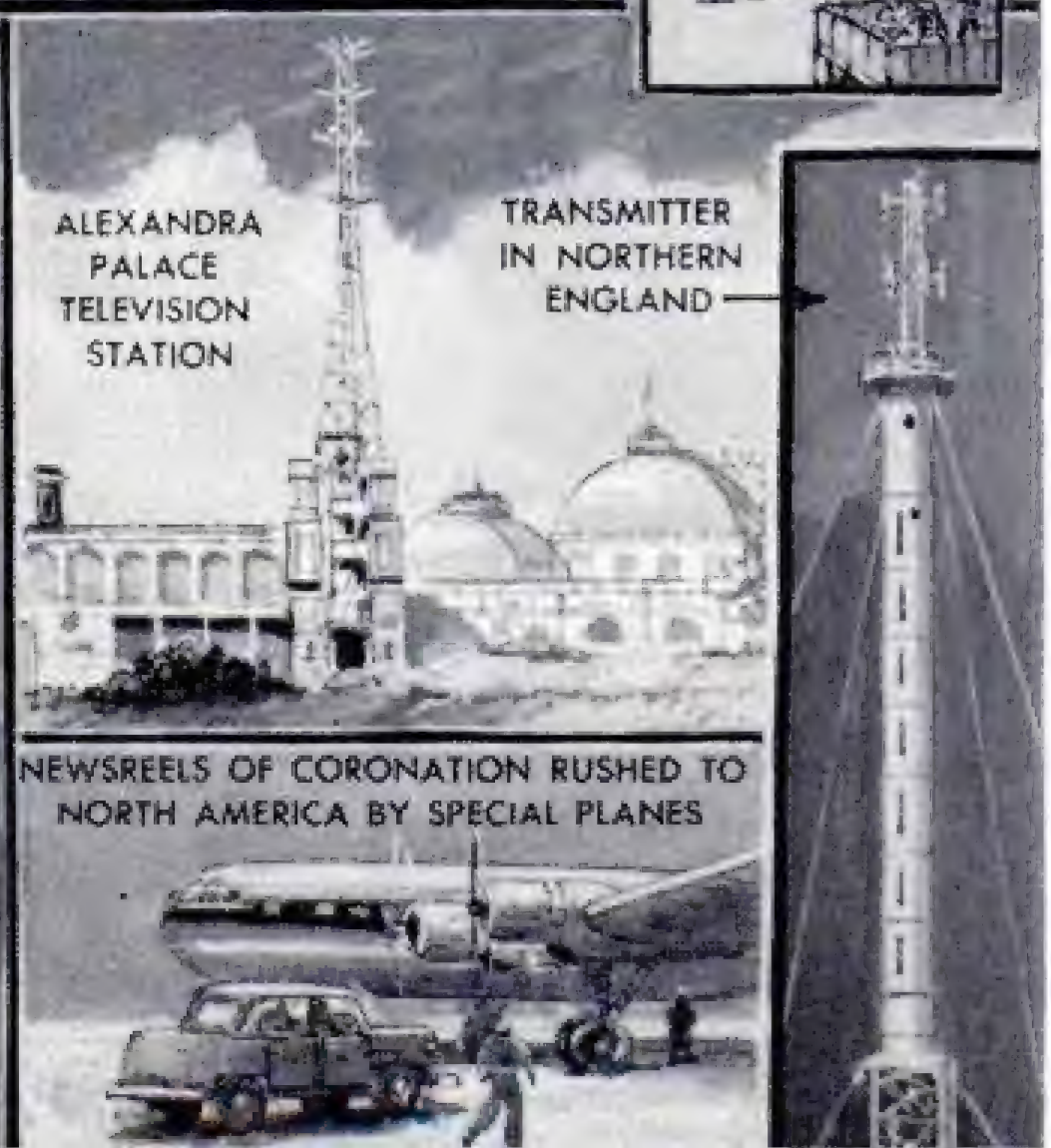
RCA photo





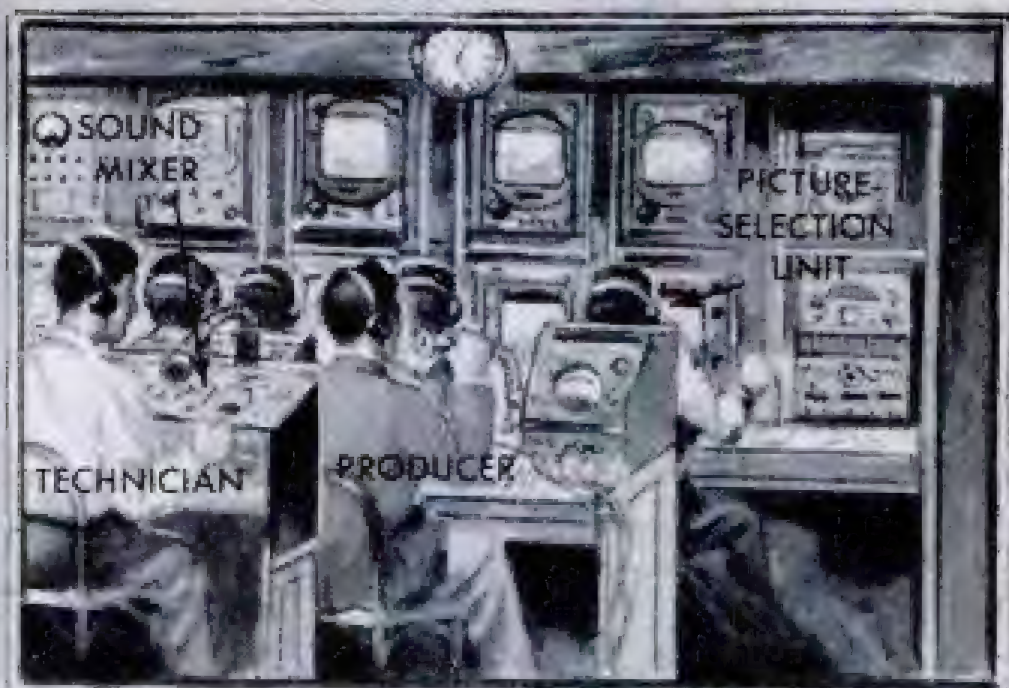


TV cameras spotted along the coronation route and inside Westminster Abbey will record the spectacle. Linked by coaxial cable to Broadcasting House and Alexandra Palace, their output will be monitored in mobile vans and control huts located beside Westminster Abbey and at the base of Queen Victoria Memorial. As the two-mile-long procession wends through the streets of London, cameras will peer from the roof of Buckingham Palace, from high stands erected along the route and from the windows of buildings facing the abbey. Microwaves will relay the scenes to north and west Britain and over a planned hookup to Europe. Planes will rush film to America





CONTROL-HUT INTERIOR

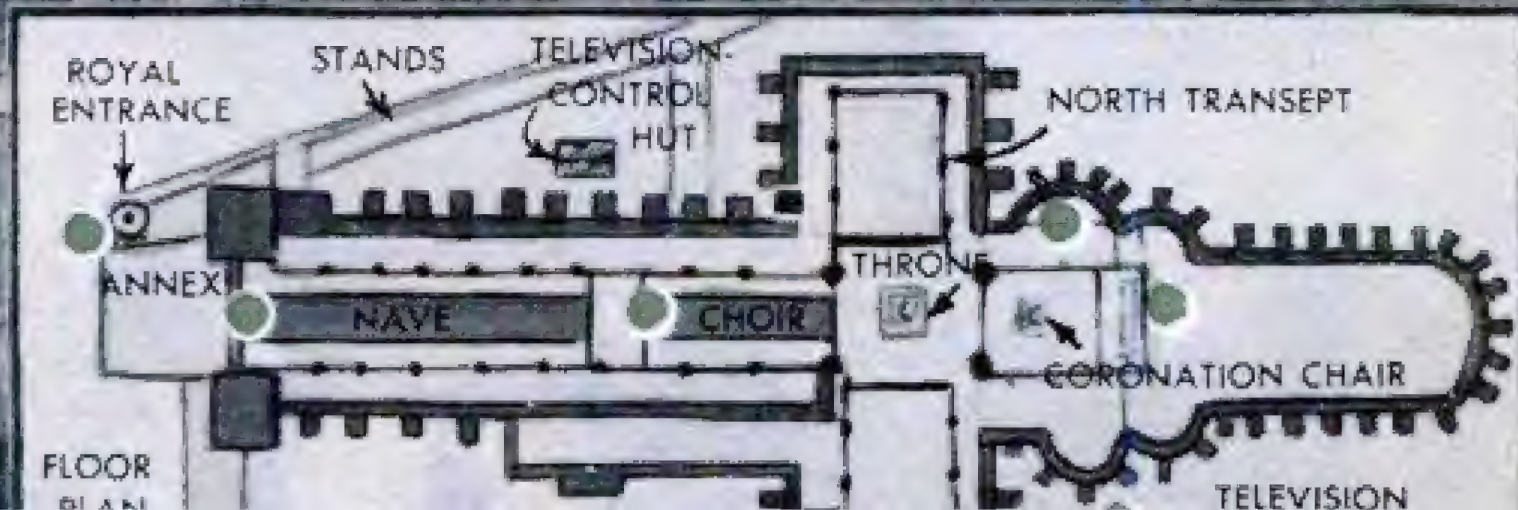
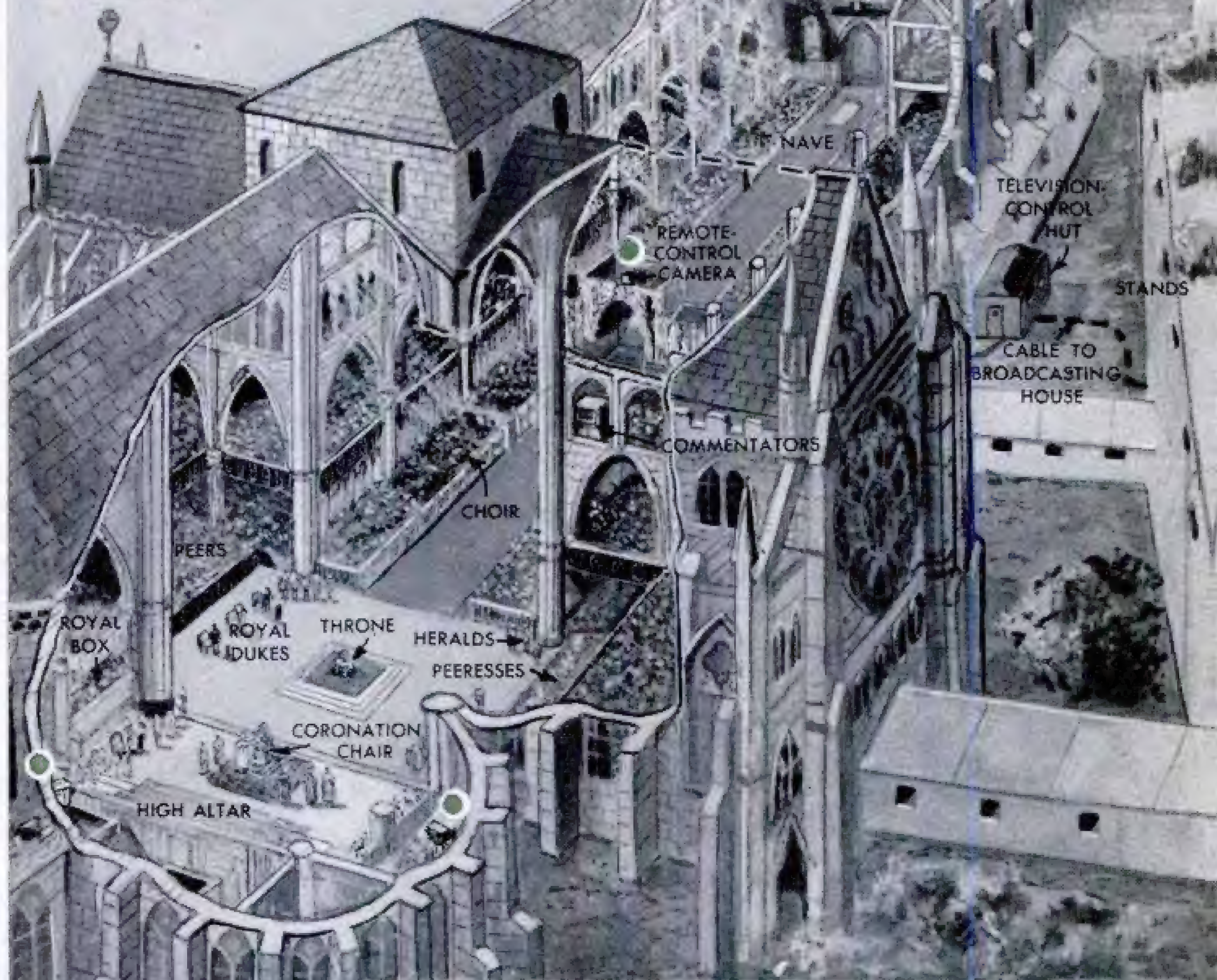


SOUTH TOWER

NORTH TOWER

## WESTMINSTER ABBEY

SOUTH TRANSEPT





in its infancy by United States standards: In all the rest of the world there are about 2,350,000 receivers compared to around 21,000,000 here. But the "baby" is growing fast.

At last count, eight countries in the Western Hemisphere and eight in the Eastern Hemisphere enjoyed television regularly. A dozen other lands have experimental stations. And at least 30 more nations are currently making plans for video.

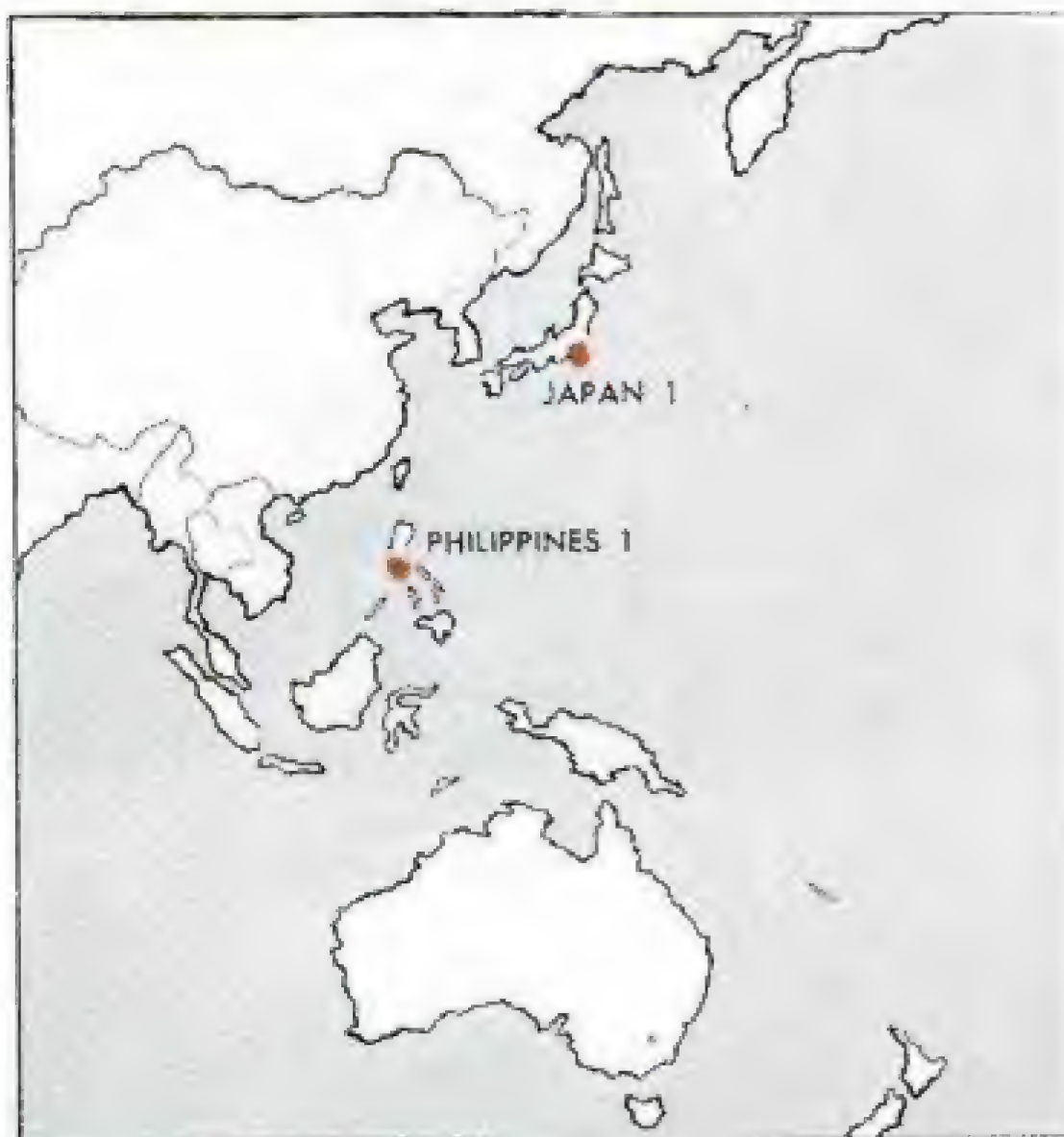
Great Britain has more television sets—1,700,000 of them—than all other foreign countries put together. Microwaves and coaxial cable carry London programs to viewers all over England, to Wales, Scotland and across the Irish Sea to Belfast, the new Irish station scheduled to open in time for the coronation.

England is abuzz with plans for greatly increased television service. Although at present 70 percent of the population is within range of TV, there's only one channel to watch. Like almost all television and radio systems outside the Americas, Britain's video is state-controlled. Each set owner must pay a license fee equivalent to \$5.60 yearly. Detection vans, staffed by government personnel, track down unreported sets.

But commercial TV has been proposed in England. Up to 50 stations backed by major advertising agencies may be in the wind, each to have a radius of from 10 to 15 miles.

Zenith Corporation's Phonevision, a plan to telecast movies to paying watchers, is also under scrutiny.

English television equipment ranks with the world's best. Practically all foreign TV stations are built by either American or British firms. Britain is also a leader in



industrial and educational TV—in one London bank you may examine your balance sheet on a TV screen, though the files are kept 12 miles away. The army, navy and universities teach classes by TV.

First in the world to inaugurate regular television service, the British Broadcasting Company started telecasting a short program daily in 1936 from its Alexandra Palace studios.

Today, as then, the BBC telecasts a 405-line picture at the rate of 25 frames per second, using AM sound. Americans who have seen English TV say it compares favorably with our system, which uses a 525-line picture at the rate of 30 frames per second, with FM sound.

When special television programs are



Operas aren't the only fare on Italian TV. Slapstick dancers in Milan stumble through their routine before the camera

*International General Electric photo*





beamed across the English Channel to France, they must be rescanned by a special converter to change the picture to an 819-line standard. For transmission to other European countries, with the exception of French-speaking Belgium, the image has to be changed once more, this time to 625 lines. By this time, it may, understandably, be a little fuzzy.

BBC officials are talking hopefully of a hookup linking Brussels, Berlin, Rome, Paris and London by the end of 1954.

The largest number of receivers on the continent of Western Europe is in France,

where 55,000 sets operate, some of them for the benefit of community viewing groups sponsored by the French League for Education. Two stations transmit from the Eiffel tower in Paris. Another is at Lille, linked to Paris by relay. Six more are proposed or under construction.

Italy expects to have five modern stations by the end of 1953, and expects the number of receivers to jump from 5000 to 60,000 during the year. A Vatican City station, one in Milan and one in Turin are telecasting now. An elaborate network stretching the length of the boot and jogging over

Tokyo citizens jam department-store exhibit of television receivers. Regular telecasts began there in February

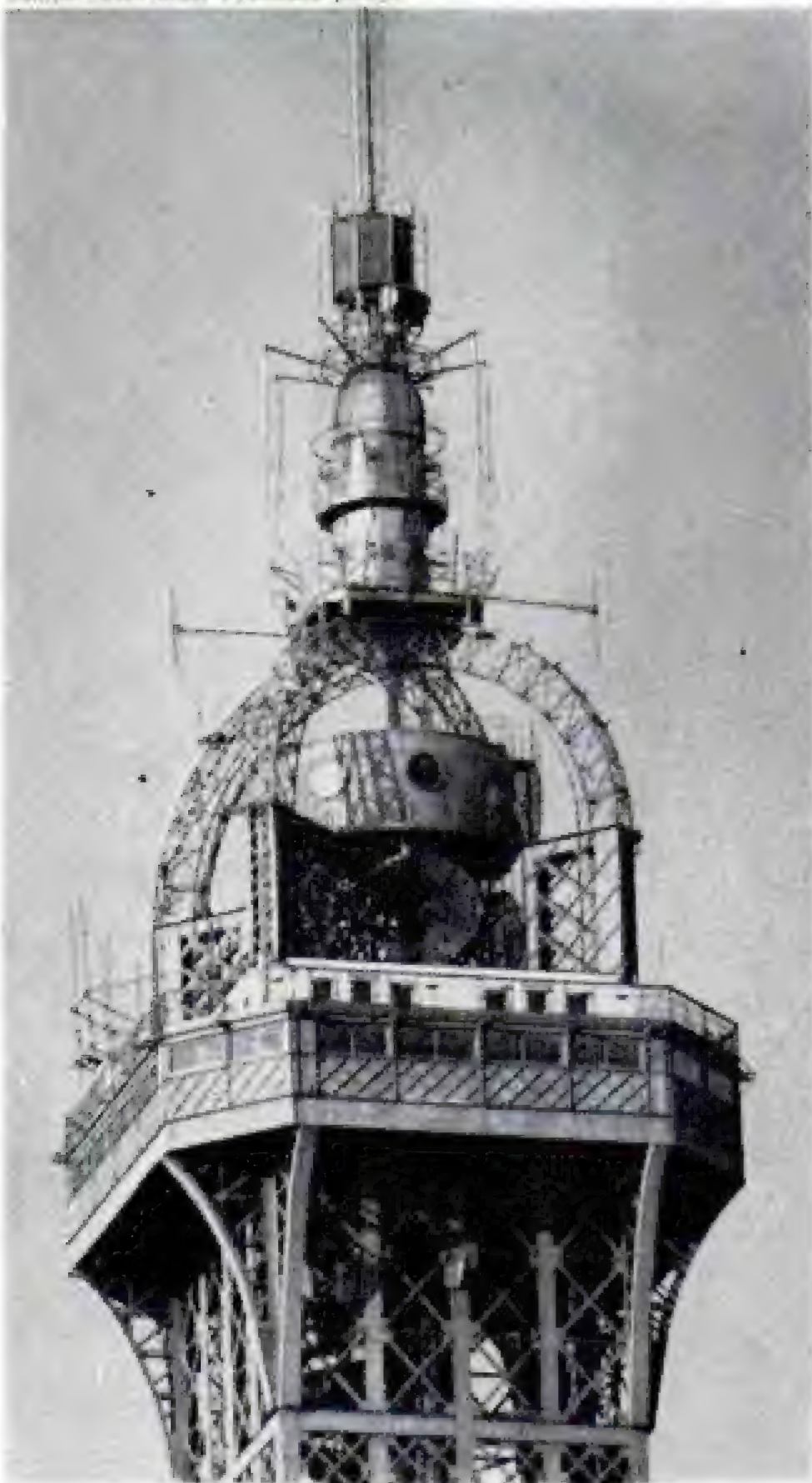






Closed-circuit television in Melbourne enabled over 500 Australian doctors to witness unusual surgery at close range during a recent medical convention. Below, TV transmitter and antenna atop Eiffel tower

Radio-Television Française photo



to Sicily will probably cover the country by 1954 or 1955.

Germany is beginning to hit its stride in TV, although few programs are being telecast now. Hamburg and West Berlin stations are operating, and Hamburg and Cologne were linked last December by microwave. Frankfurt is scheduled to join the hookup by mid-1953. Four other stations are planned, one of which would connect with Zurich, Switzerland.

Switzerland, like many another small European country, is beset with problems caused by small population and the high cost of TV-station installation and operation. Sets cost far more than the average European can afford. Revenue must come from license fees, not advertising budgets, since most Europeans are horrified by the thought of United States type commercial programs. (Italy, which started out with privately owned television, recently took control of the stations away from the owners and put them under government supervision.) An added Swiss difficulty is the nation's three languages—French, German and Italian.

Belgium has the same problem, with French and Flemish the two official languages. The newly opened Brussels station is bilingual, and the proposed station at Liege will be Flemish. A peculiar problem in Belgium—the fact that some receivers use the French standard to pick up French telecasts, others use a 625-line standard—has been solved by two stations under construction which will operate on either the 819 or 625-line system.

Television was almost booted out of Denmark last year, after experimental telecasts

(Continued to page 254)



## Retractable Launching Pod Gives Sabre Jet a 24-Rocket "Punch"

One volley of rockets from a new retractable launching pod that pops out from the belly of an F-86D Sabre Jet will shoot down the world's largest bomber. Immediately after firing, the pod snaps back into the airplane to restore its streamlined surface for near-sonic flight. It holds 24 rockets, each roughly equivalent to a 75-mm. artillery shell and traveling to the target at about 2000 miles per hour. A Sabre Jet fully loaded with rockets streaked to a world's speed record of 698.5 miles per hour last November.

## Iraq-to-Paris Pipe Line To Carry Natural Gas

Proposed by an American firm, a pipe line connecting Iraq and Paris would transport natural gas a distance of 1800 miles. Intermediate cities served would include Ankara, Istanbul and Trieste. Compressors in 15 stations distributed along two parallel lines would push through 1,000,000,000 cubic feet of gas daily. The line, which would cost around \$775,000,000, would make natural gas the cheapest fuel in the Paris area, it is said. An alternate longer line would originate in Saudi Arabia, cross northern Africa to Morocco and veer northward to Paris by way of Spain.



North American Aviation, Inc., photo

## Ceramic Brakes for Aircraft

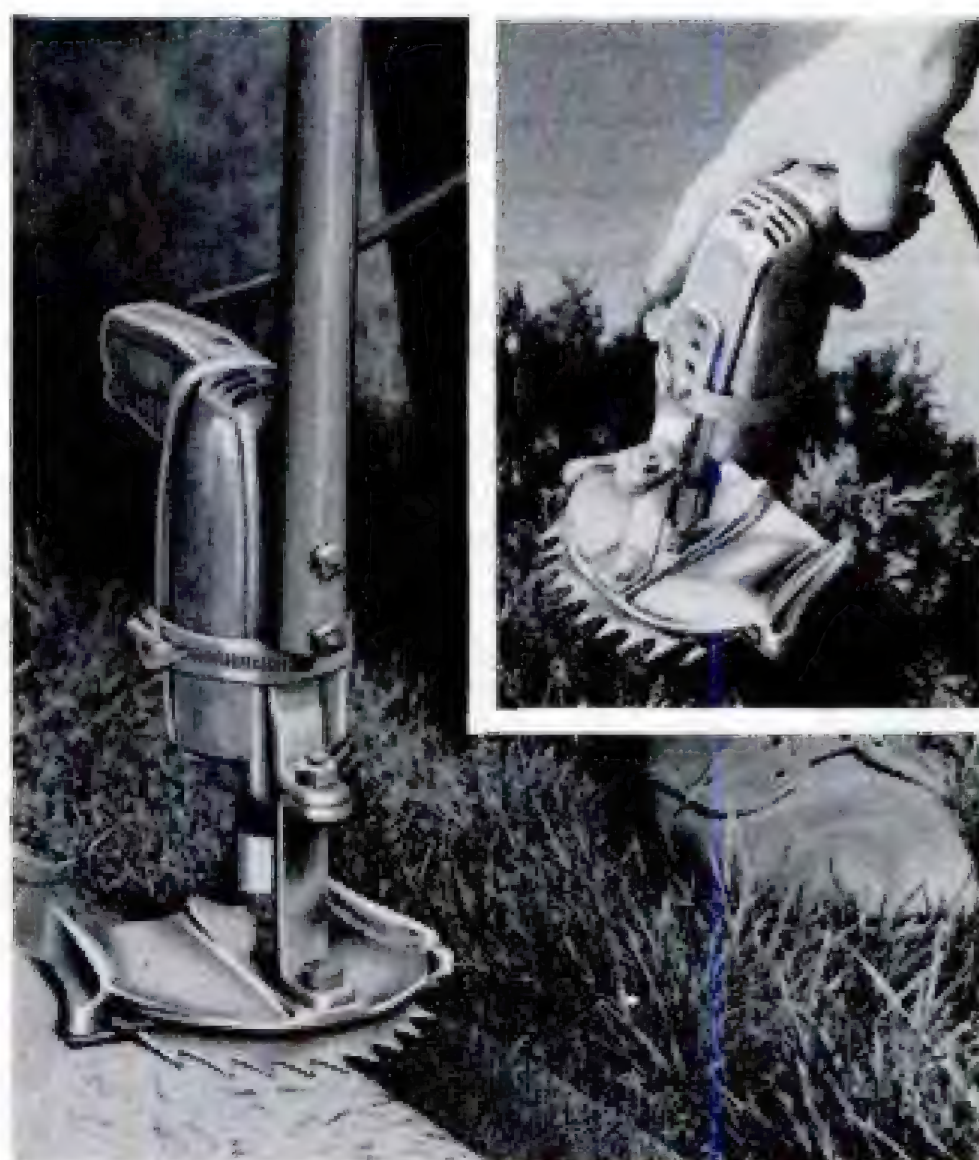
Fired clay is the main ingredient of a brake lining which withstands the terrific heat caused by the sudden stop of a jet plane or transport. The lining meets the need for a brake which could stop 17 tons of plane in 20 seconds from a ground speed of 135 miles per hour.

## Edger-Trimmer Attachment Driven by Electric Drill

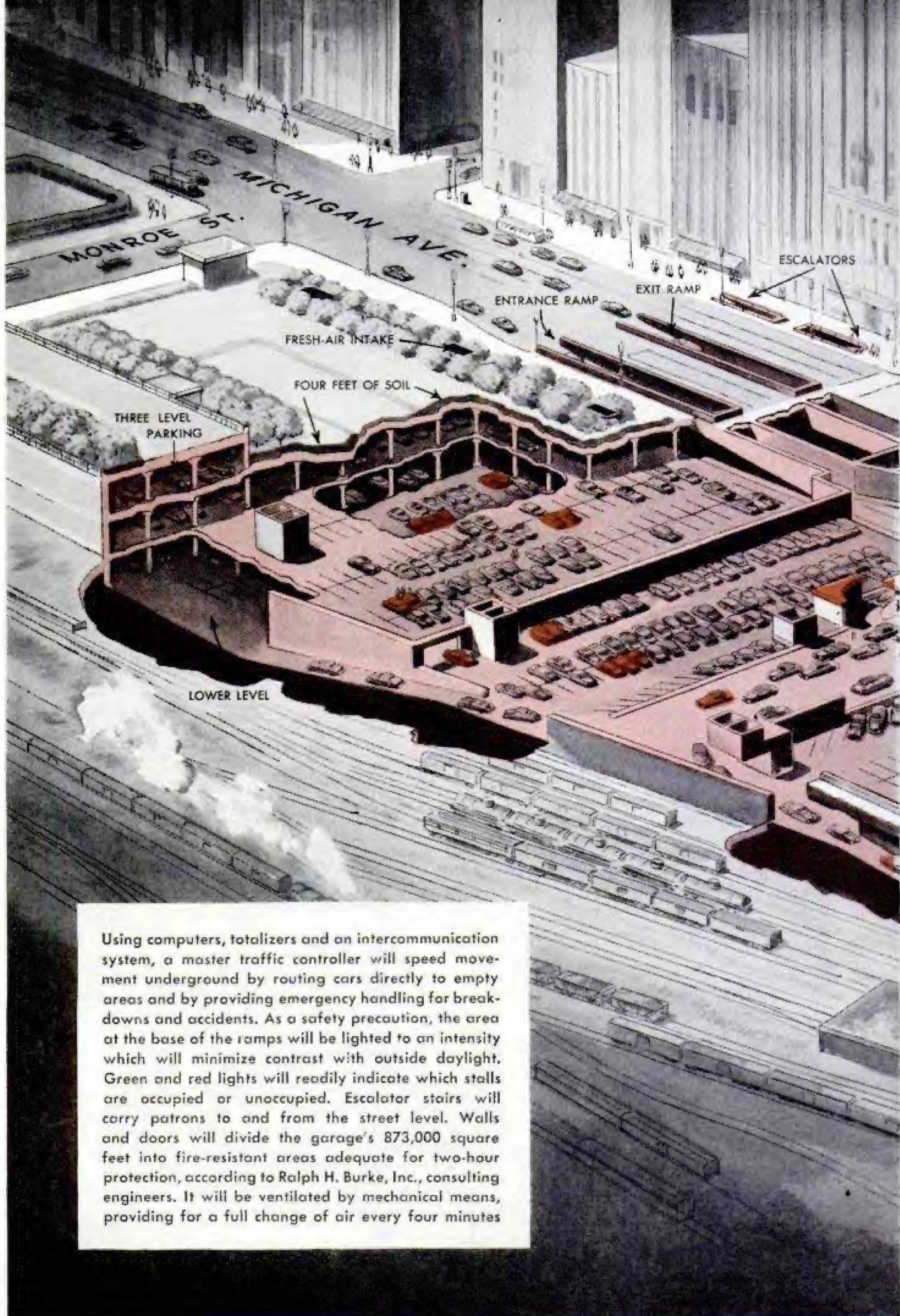
By chucking a new attachment into any  $\frac{1}{4}$ -inch electric drill, the homeowner forms a power-operated lawn edger and hedge trimmer. The whirling blade cuts grass close along the edges of sidewalks, walls and fences. A long handle takes the stoop out of lawn work and can be quickly removed when the tool is used as a trimmer.

### *The Drag Strip*

Ever heard the phrase? A drag strip is an isolated stretch of pavement where heavy-footed hot-rod drivers can race from dawn to dusk—safely, legally and with a big audience. There are more than 30 such strips scattered across the country, roaring proof that street racing can be taken off the street. Supersouped-up stock cars, motorcycles, homemade cars—anything on wheels—zoom down the strips at speeds up to 130 miles per hour in a race against the clock. In the July issue, "Lightning Hits the Drag Strip" tells the story of these unique straightaways and how they contribute to highway safety.





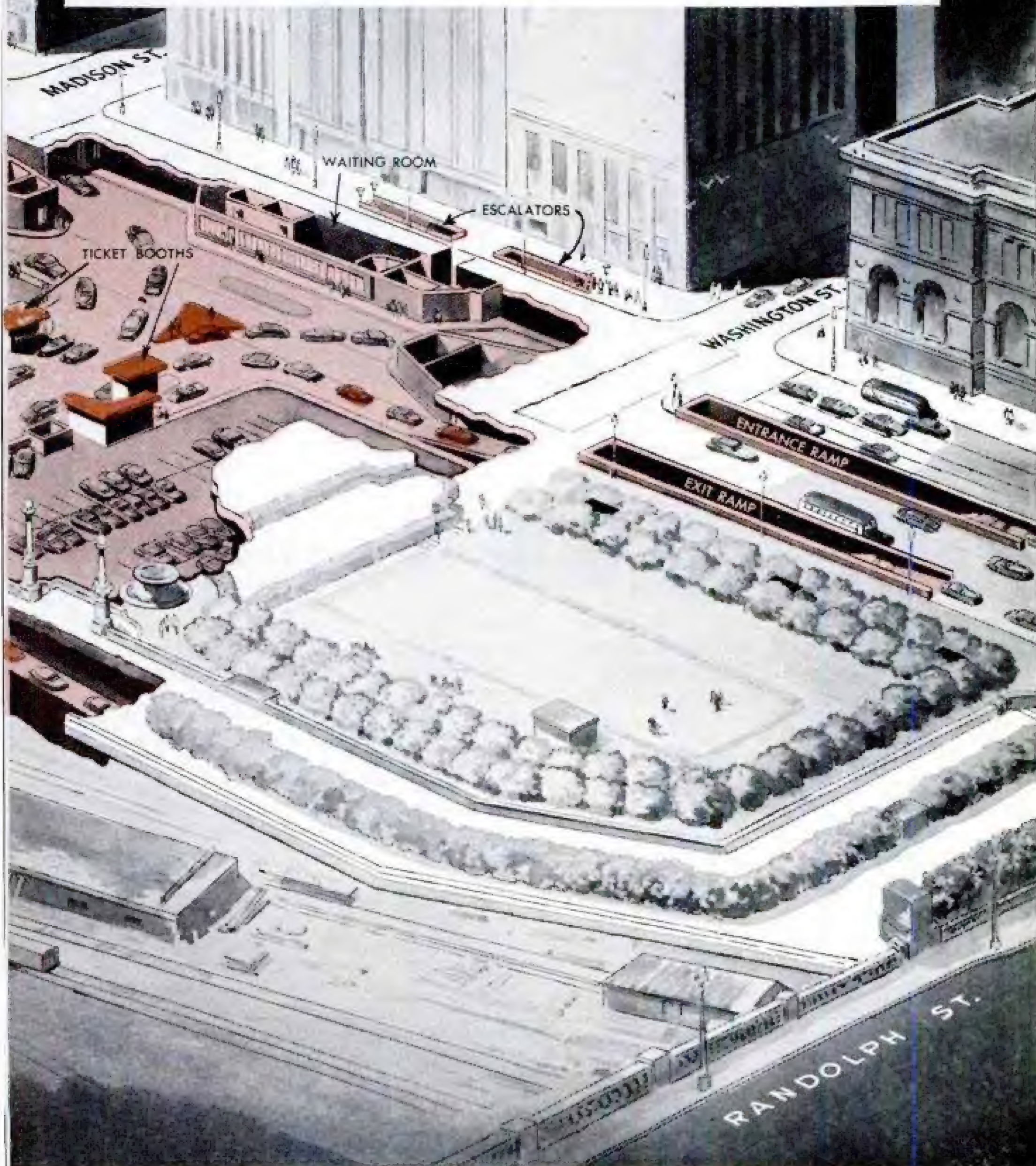


Using computers, totalizers and an intercommunication system, a master traffic controller will speed movement underground by routing cars directly to empty areas and by providing emergency handling for breakdowns and accidents. As a safety precaution, the area at the base of the ramps will be lighted to an intensity which will minimize contrast with outside daylight. Green and red lights will readily indicate which stalls are occupied or unoccupied. Escalator stairs will carry patrons to and from the street level. Walls and doors will divide the garage's 873,000 square feet into fire-resistant areas adequate for two-hour protection, according to Ralph H. Burke, Inc., consulting engineers. It will be ventilated by mechanical means, providing for a full change of air every four minutes

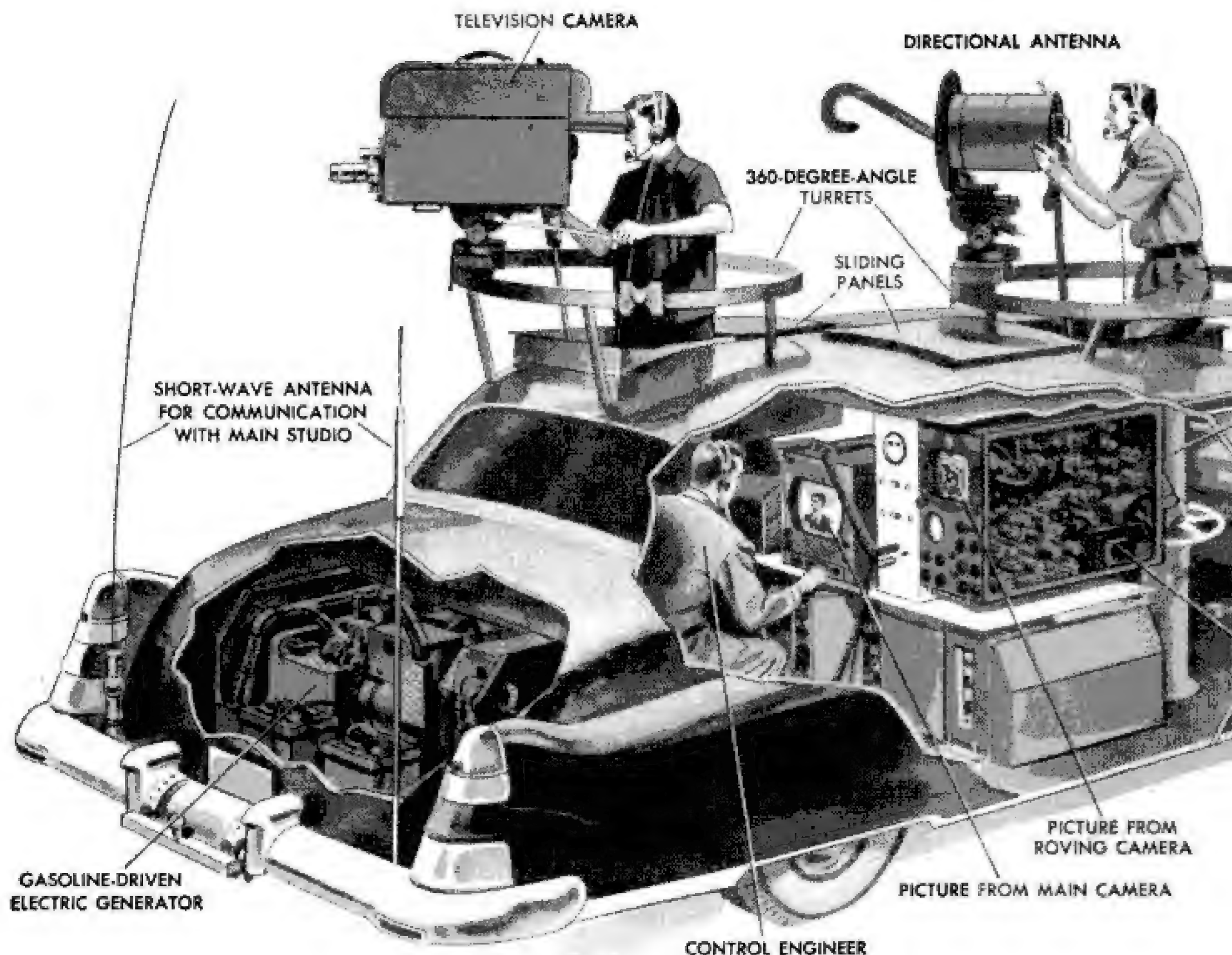


# Chicago Builds a Three-Story Underground Garage

**T**HREE BLOCKS of Chicago's lake-front park and a like section of its most heavily traveled street are temporarily uprooted as the city digs its first underground garage. The three-level subterranean building will accommodate 2359 automobiles. Cars using it will stream directly into and from traffic on Michigan Avenue over four ramps kept snow and ice-free by radiant-heating panels. After parking tests by nonprofessional drivers, the storage bays were built 27 feet wide for three cars and the aisles made 22 feet wide. After completion of the garage next year, Michigan Avenue and Grant Park will be restored approximately four feet above the roof of its upper level. ★ ★ ★







# NBC's \$62,000 CADILLAC

**B**OOOOOM! An ugly rumble thunders through the canyons of New York City. Fifteen miles away, across the Hudson River, a huge ball of dirty black smoke billows upward over New Jersey's industrial valley. Something big has exploded!

Within minutes, sirens wail as fire and rescue apparatus, along with speeding press and radio cars, head for the river tunnels to converge on the disaster area. Most of this rocketing horde is familiar. But, within the past few weeks, a brand-new mystery car has joined the pack. It's a sleek, black Cadillac limousine with blacked-out rear windows. It weaves through traffic with the supple ease of a frightened deer. From a pair of low hatches in its roof, the heads and torsos of two men jut through steel rings of standard Army tank machine-gun turrets. But they handle no guns. One circular track supports a television camera mounted on rollers that permit it to sweep in a full 360°. On the

other sits a big, barrel-shaped antenna whose "question mark" can be aimed in any direction to maintain continuous line-of-sight contact with a studio antenna atop a skyscraper. Packed in the limousine's trunk, a generator whirs up the electric power to run its ton of special electronic equipment. Behind blacked-out windows, video and audio engineers control what its designers claim as the most compact monitoring studio ever devised. A sardine couldn't gain space in this gleaming vehicle.

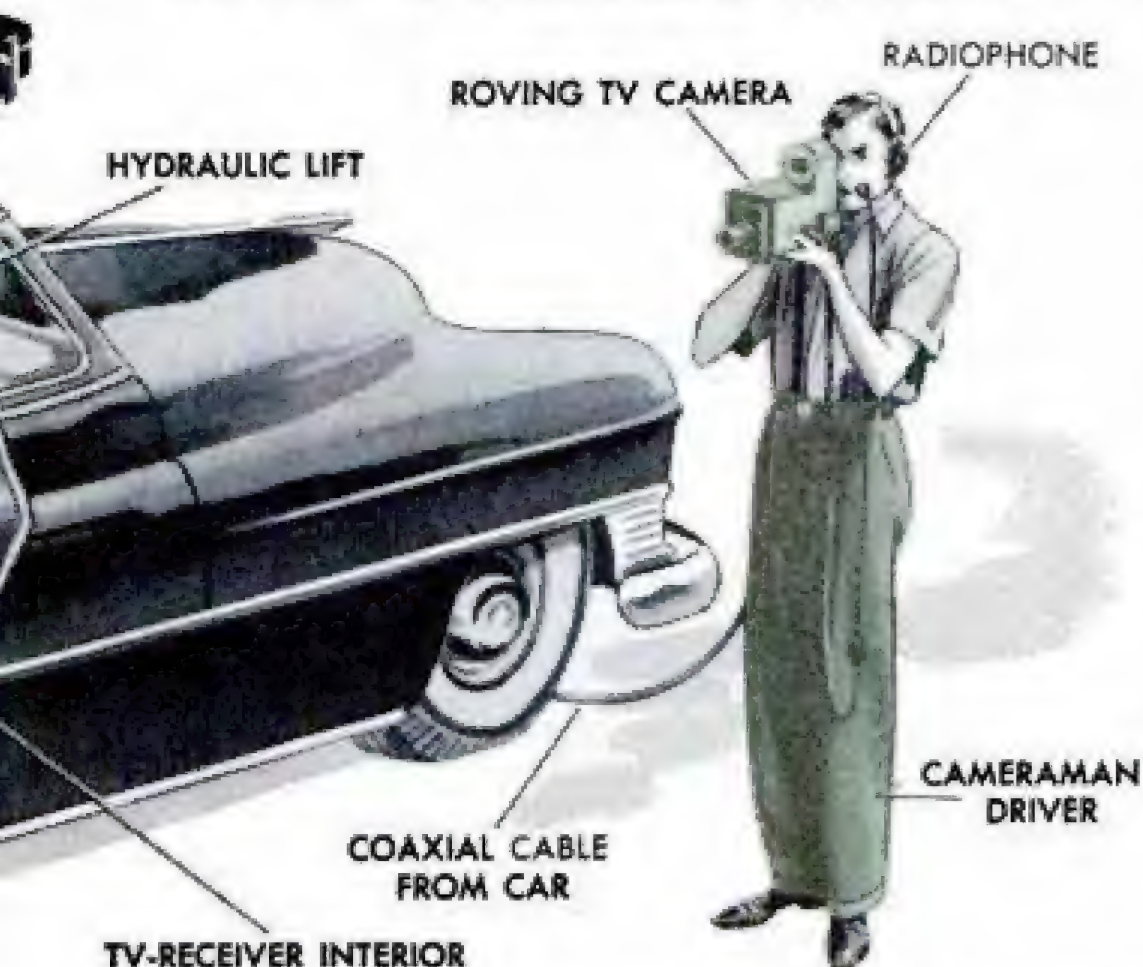
The mystery car is NBC's self-contained mobile studio, packed in the narrow confines of a standard production-line automobile. On the way to a disaster like that hypothetical explosion, it may telecast on the run. Once there, it can be set up in stationary position and bounce a signal for 20 miles to the home station for relay.

Along with other new developments—including a midget eight-pound TV camera a little larger than a box-type Brownie, and



a special "industrial monkey" that can lift a cameraman and his complete outfit here and there over a scene like a Lilliputian in the hand of a Gulliver—the unit is designed to carry TV's roving eye into tight places where massive vans and tons of equipment could never go.

"Television," says C. H. Colledge, NBC's Director of Engineering Operations who



Mobile unit set up for action, with roving camera in use. Antenna is aimed at relay on near-by building

conceived the idea for the limousine studio, "should be as mobile as newsreels." Most mobile units are as big as moving vans. They're paralyzed in traffic. They can't get down narrow alleys or crooked streets. They bog down on muddy roads and fields.

They require the use of a big trailer generator—or else there's a hunt for power and permission to string cable.

To illustrate, Colledge recalls the time a big airliner coming into Washington's National Airport undershot its approach and wound up in the water. "The big unit we had then," he says, "couldn't squeeze through a narrow place in the road that led to the water's edge. We couldn't drive it off the road because the monster would have bogged down in mud. We had to park, string yards of cable, rig up a temperamental trailer generator, set up our massive 100-pound cameras and then try to shoot over the heads of the crowd as victims were brought ashore. We got some swell shots of Homburg hats and backs of bald heads. With the Cadillac, we could have rolled right up to the edge of the water. The cameraman on the roof turret could have shot right down on the people coming ashore and you'd have been able to see the expressions on their faces."

Colledge can cite dozens of similar frustrating assignments, like the time his crew spent an hour power hunting and cable laying before they could televise the scene of the train that crashed through Union Station in Washington. "In spite of it, we were on the air an hour and seven minutes after it happened," he recalls. "But with the limousine studio, we could have wheeled right up to the station, hooked up the hand camera, and sent a man inside the station with it. We'd have been telecasting ten minutes after the crash."

Last winter, Colledge and a group of

Camera and directional antenna are mounted in tank-type turrets, revolving in full circle on top of Cadillac





General Motors engineers had put their heads together. A standard seven-passenger car was pulled off the line. Its insides were ripped out. Two months and \$62,000 later, TV's wandering midget studio was a reality—just in time to make its debut covering the inauguration of President Eisenhower last January.

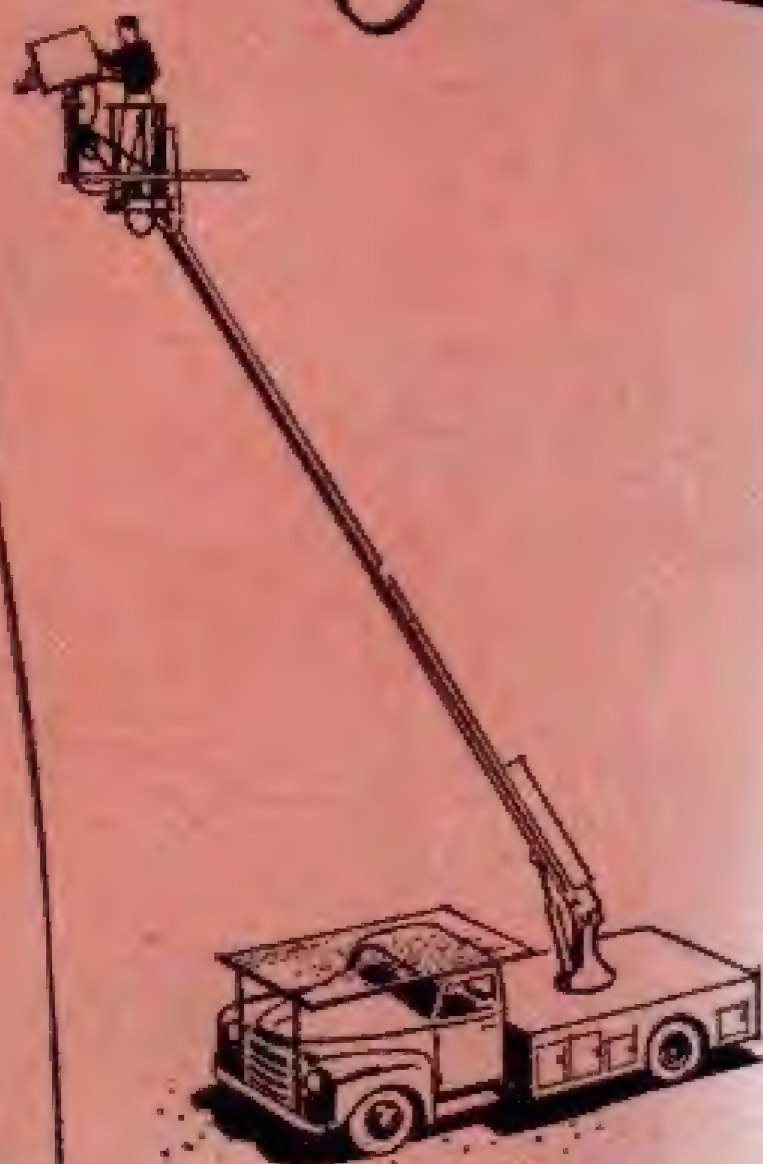
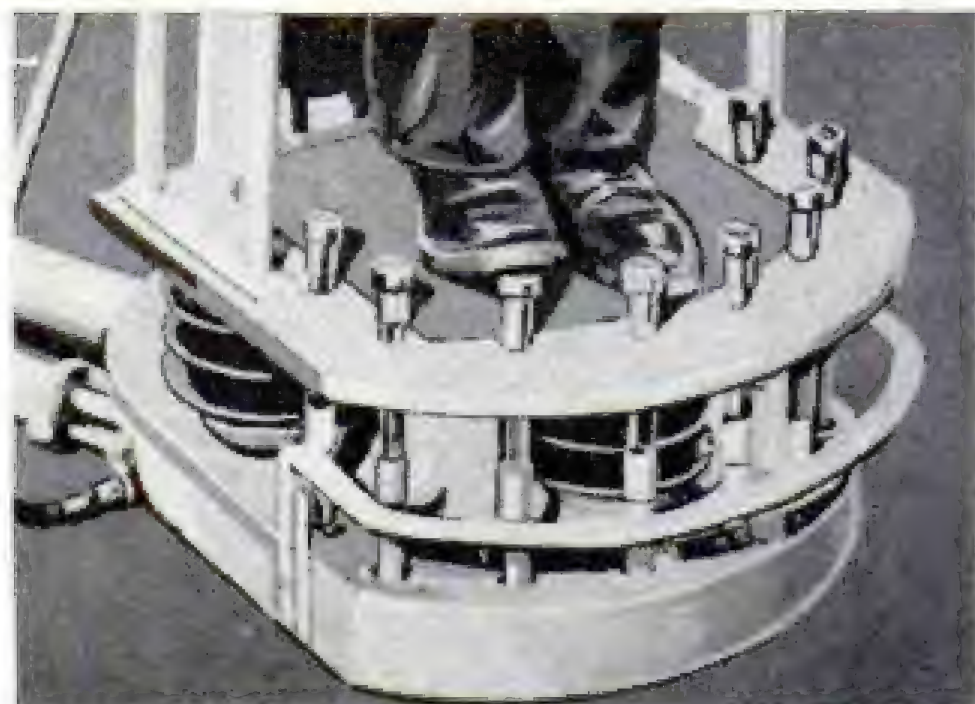
Manned by four engineers and a commentator, huddled around nearly one ton of incredibly compact telecasting equipment, the unit slithered in and out among elephants, tanks, cowboys, diplomats and blaring bands of the 10-mile inaugural parade—passing along everything it saw to TV watchers from coast to coast.

There couldn't have been a better opportunity to test the vehicle—which the men had dubbed "the traveling eye." Cameraman and antenna engineer shoved back the sliding panels that covered the turret holes like hatches on a small boat. They

(Continued to page 262)



The "industrial monkey," consisting of hydraulically operated boom, swivel-mounted on a truck bed, gives the modern TV cameraman a sky hook. Above, cameraman rides in a bucket. Right, he stands on platform. With a touch of a toe button, he can soar upward 40 feet or extend himself in any position above truck





## Miniature Television Camera Connects Directly to Receiver

Industrial television has received a large shot in the arm with the introduction of a miniature TV camera which connects directly to a standard TV receiver. All associated power, synchronizing, monitoring and output equipment, plus the camera itself, is housed in a unit no more bulky than a portable typewriter. A coaxial cable from the camera unit connects to the TV receiver, which is plugged into a wall outlet. Pictures are received in any one of the 12 standard TV channels. It will reportedly feed multiple TV receivers with excellent pictures at distances up to 2000 feet. Simple to operate, the portable unit eliminates the bulky and expensive auxiliary equipment which took hours to install and required operation by



trained technicians. Both RCA and DuMont have announced production of similar miniature units.

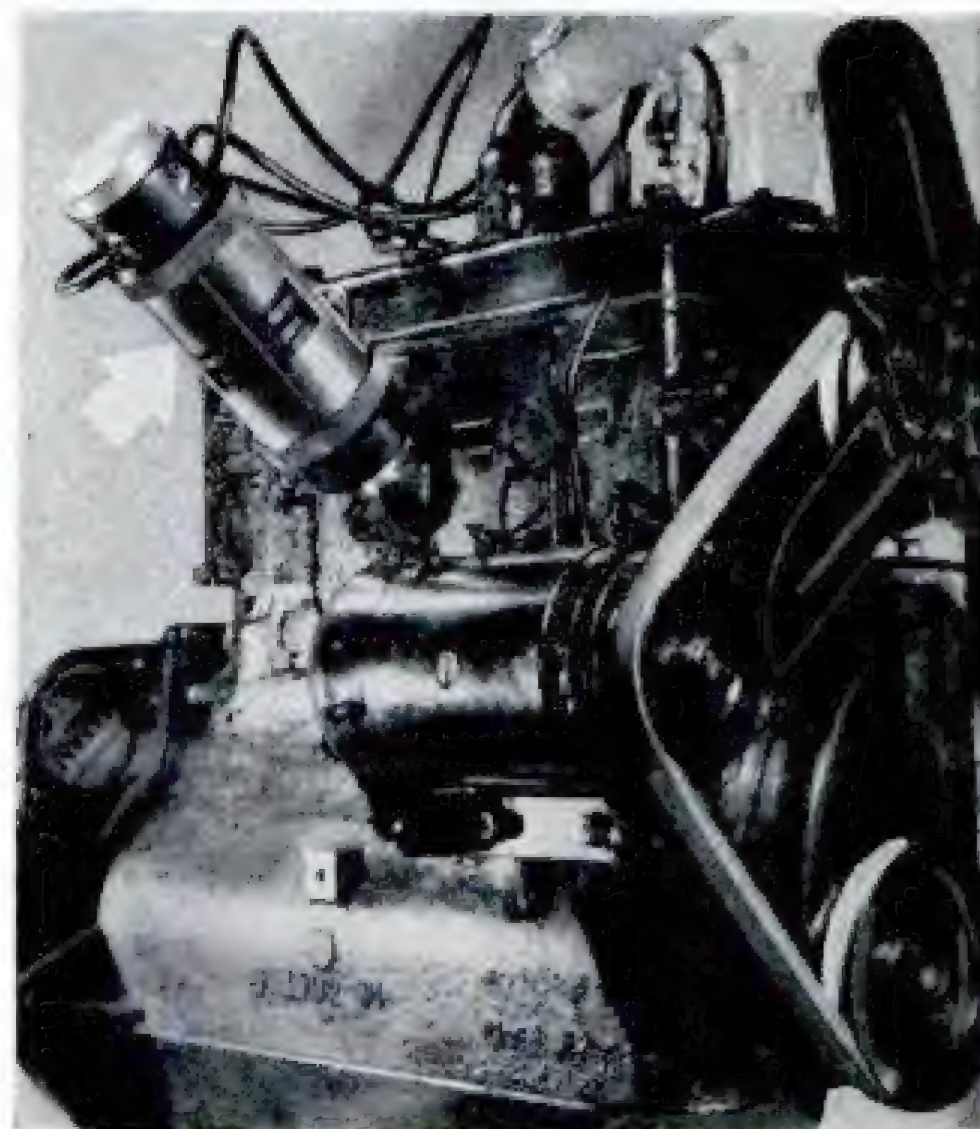
## Sponge-Rubber Sanding Pad Speeds Boat Finishing



Mounted on the shaft of a portable workshop drill, a disk with a sponge-rubber face forms the backing for various grades of sandpaper. Made especially for boat finishing, it conforms to every curve of hull, spars, deck and cabin top, sands down old paint, cuts down protruding seam compound and sands between coats when new paint is applied. Because it does not cut into the wood around the edges, it permits smooth and rapid work by the amateur craftsman. Two types of disks are available, one of soft and one of firm rubber. The sandpaper is held in place with adhesive.

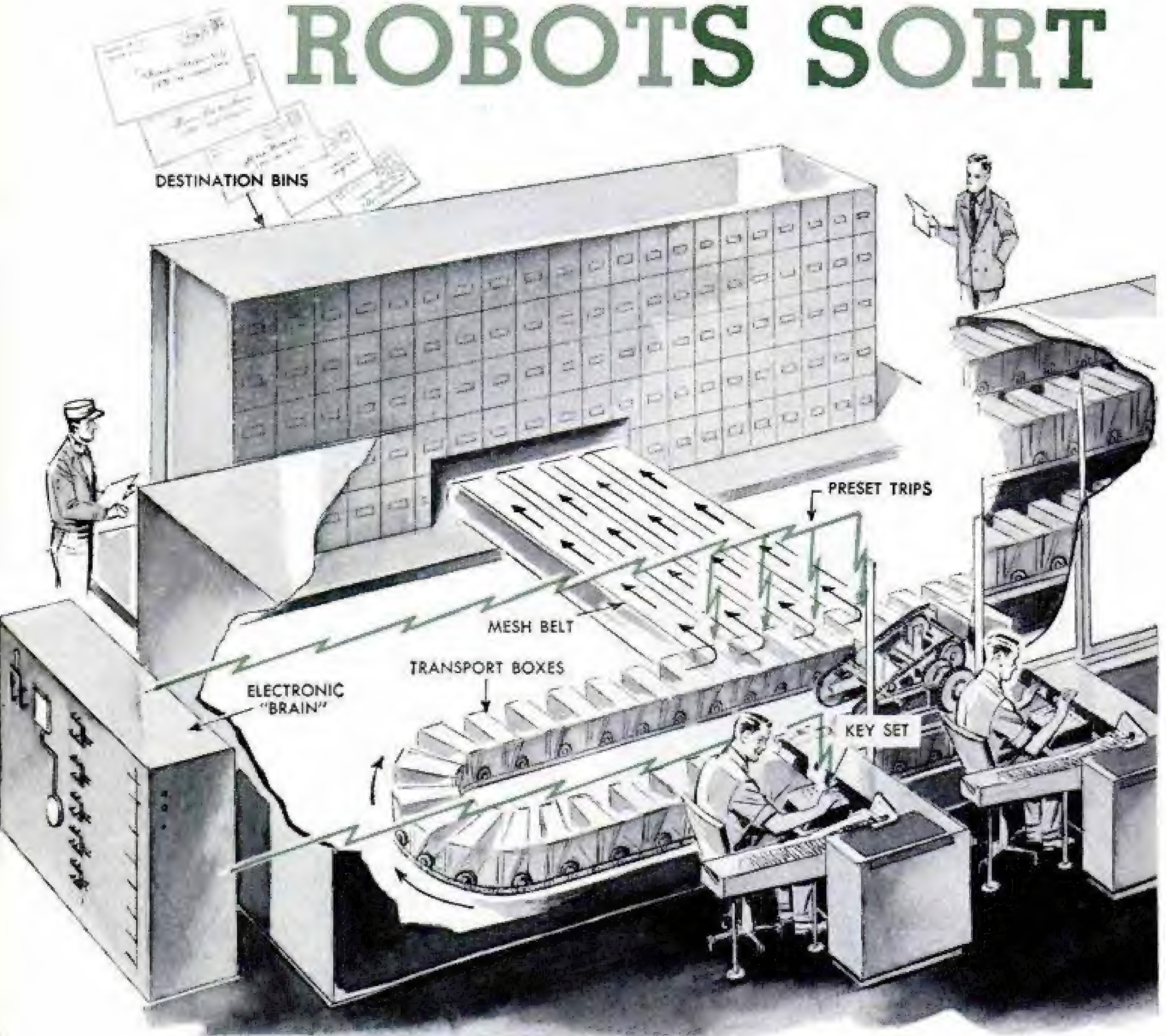
## Electrostatic Ignition Won't Burn Spark Plugs

Fouled spark plugs and shorts caused by moisture and grease won't bother motorists anymore, according to the inventor of an electrostatic ignition system. Combining the best features of battery ignition and magneto ignition, the system produces the same high-voltage, low-amperage spark at all engine speeds. Because high amperage burns spark-plug electrodes, the low-amperage system should mean spark plugs that last the life of the engine. No current is drawn from the battery and that makes quicker starts in extremely cold weather. There is no shock hazard in handling the high-voltage wires because of their low amperage. The system was brought to the United States from France where the generator, which is mounted beneath the distributor and is the heart of the system, was invented.





# ROBOTS SORT



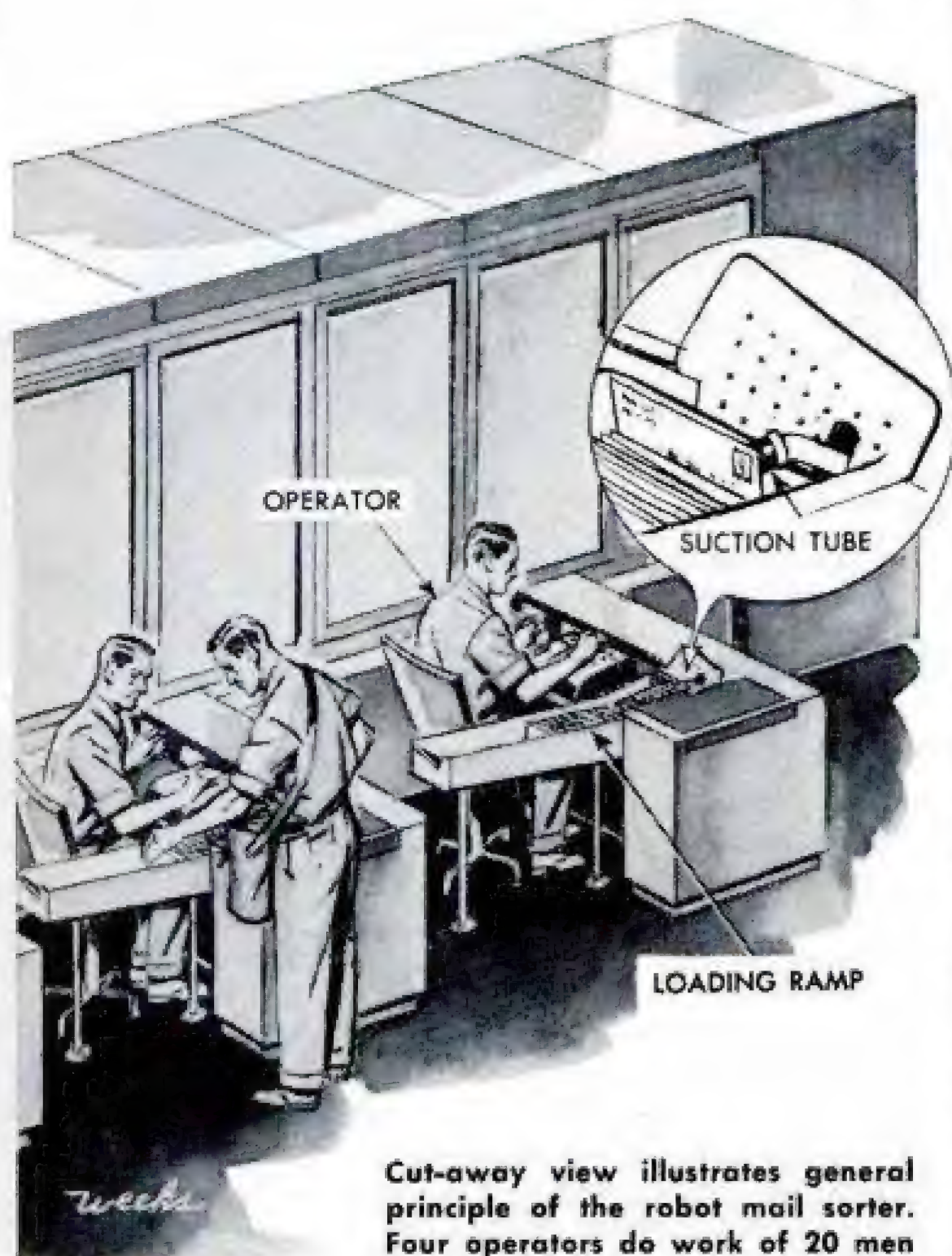
Letters on ramp feed into conveyor which carries them in front of operator, who taps out destination code

Pneumatic tube darts out of hole in perforated plate, grabs a single letter and drops it into conveyor





# THE MAIL



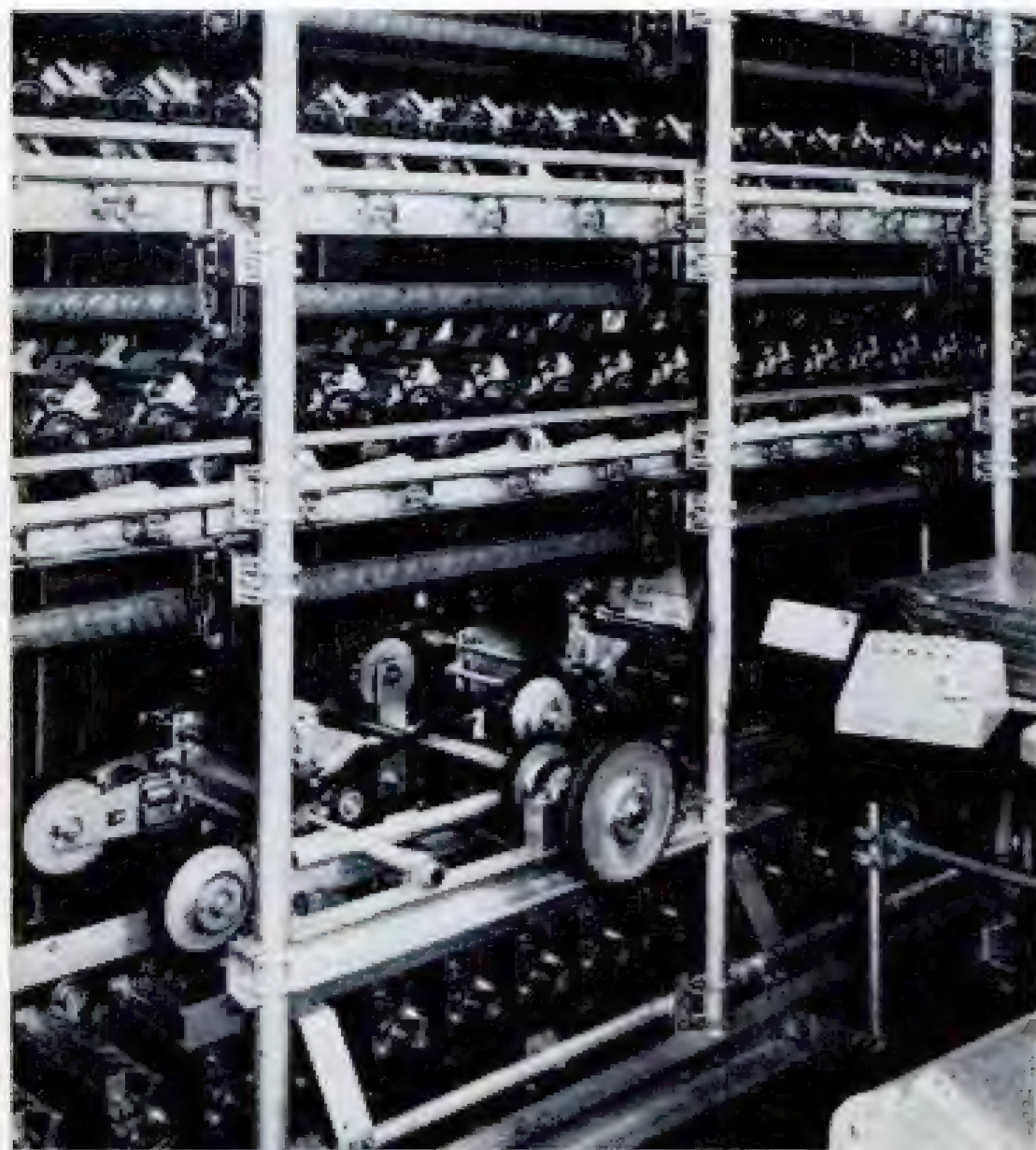
Cut-away view illustrates general principle of the robot mail sorter. Four operators do work of 20 men

**E**LMINATING human bottlenecks in mail-sorting work, an electromechanical machine in the Antwerp and Brussels, Belgium, post offices allows four operators to distribute up to 16,800 letters per hour among 300 different boxes. Three-foot stacks of mail placed beside each seated operator feed down a ramp to a suction tube which pops out, grabs a letter and drops it into a groove that runs across in front of the operator. Tiny hooks moving along the groove catch the bottom corner of the letter and push it in front of the operator, stopping long enough for him to read the address and punch out a destination code number for that address on the small key set in front of him.

Snaking through the frame of the huge machine beside the operator is a continuously moving endless chain of 626 transport boxes, spaced six inches apart, which are carried past the operator on silent rubber rollers. The letter drops into its individual box and is carried through the machine until it reaches the spot where a metallic mesh belt will carry it to its proper destination box. There, the electronic code tapped out by the operator and relayed through rotary switches in near-by bays has preset a tripping device which opens the box and allows it to dump the letter. When the destination box is filled with letters, it rings an alarm which summons an attendant to empty it. The machine was developed by the Bell Telephone Manufacturing Company in Antwerp, an affiliate of International Telephone and Telegraph. ★ ★ ★

After leaving operator, letter drops into trough mechanism which feeds it to proper transport box

Sorted into 300 different categories, mail is removed from destination bins and sent out for delivery







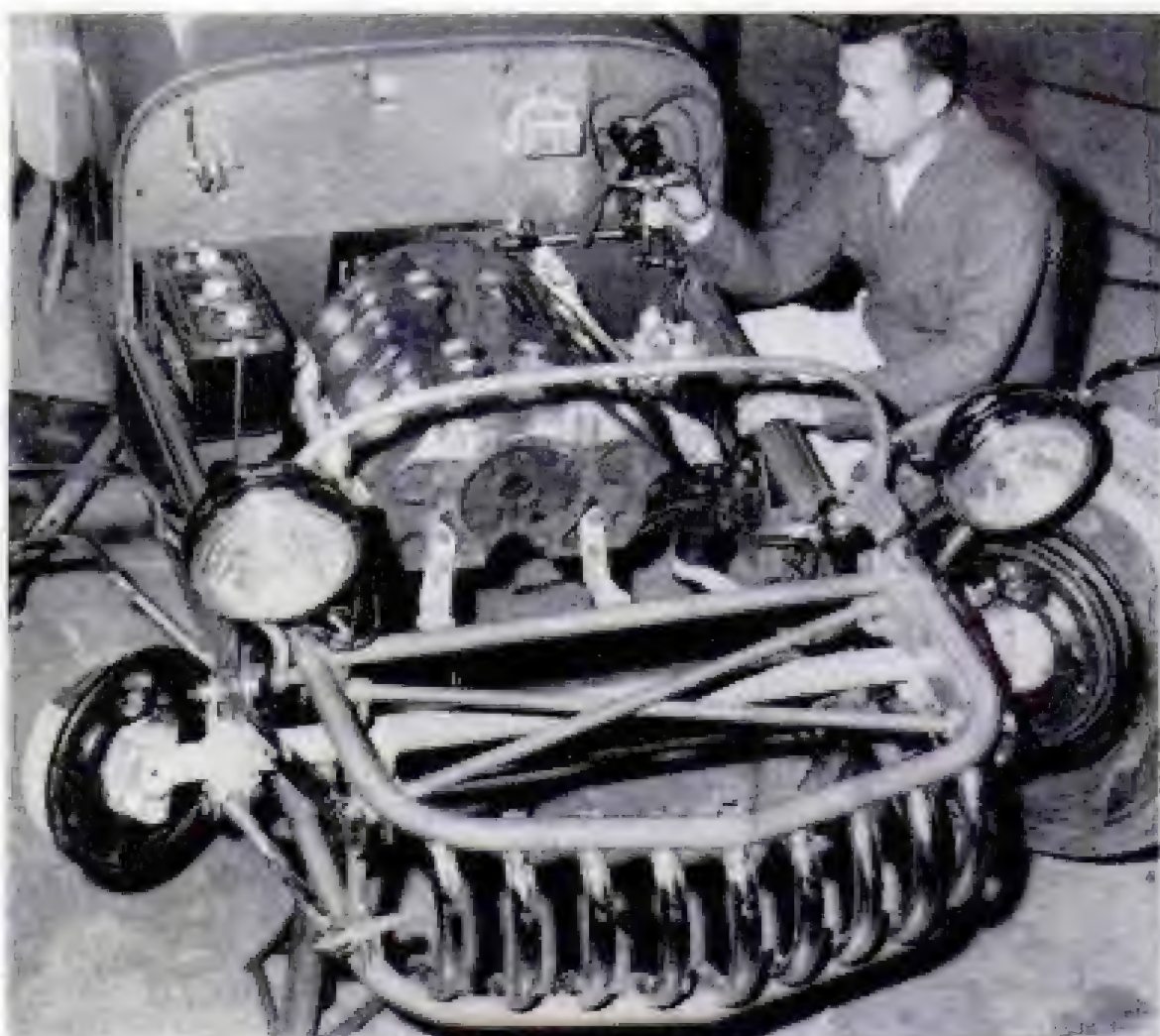
Sports car, left, is patterned after racer beside it. Fenders, lights and other refinements dress car up

## Sports Car Evolves From Indianapolis Racer

SPORTS-CAR ENTHUSIASTS now can own a competition car patterned after the record-breaking racer in which Billy Vukovich led the pack for 375 miles in the 1952 Indianapolis Race. Potential speed of the car, built by Kurtis-Kraft, a famous name in racing circles, has been estimated at 120 to 165 miles per hour, depending upon the engine used. Models are now being built to order with any of the following engines: Cadillac, Chrysler, DeSoto, Dodge, Hudson, Lincoln or Mercury. The chassis of the new car is similar to that of its racing prototype, but the body has been refined for passenger use. Lights, bumpers, fenders and doors have been added. The aluminum body is mounted on a two-inch-tubing frame. Suspension is transverse torsion

bars front and rear. Magnesium wheels and brakes with air scoops for cooling are used. The frame tubing has been perforated throughout to reduce weight without sacrificing strength. Being custom-made, the car can be ordered in a variety of dimensions. The wheelbases available range from 92 to 100 inches. Tread is 54 to 58 inches. Weight of the sports model is also variable, depending upon size and engine selected. It will be approximately 1900 pounds. Height of the car at the cowl is only 36 inches. In addition to this open-cockpit model, Frank Kurtis, car designer, plans to produce a closed-coupe model. If you like to work on cars, Kurtis will deliver the sports car in kit form and you can put it together yourself.

Left, scoops cool front brakes. Right, engine is mounted well behind wheels for good weight distribution







# ***Detroit Listening Post***

*By Siler Freeman*

**C**OMING DOWN the stretch in the first half of one of the highest production years in the industry's history, the manufacturers are turning their eyes toward the new models. But that doesn't mean next year's. It is the 1955 line on which the industry's attention is now fixed.

Easing of the machine-tool situation has made it possible to get needed large tools for carrying out V8-engine plans. Most of the companies which have not yet gone into this program are looking to complete it in time for the 1955 models.

Among them prominently is Chevrolet. Now and then the report gets around that Chevrolet will change to the more compact and more powerful V8 for 1954. That is absolutely not so and you have the word of Thomas H. Keating, general manager of the division, for it.

But what you will have, and soon, is Chevrolet's newest model, the two-seater sports car, the Corvette. The first plastic body is to be delivered to Chevrolet in June. It is expected to have a terrific impact not only on the Chevrolet future, but on that of the whole industry.

Chevrolet has sort of caught its competitors napping with the Corvette. It is well known throughout the industry that everyone watches the other fellow in his price class and tries to keep abreast of what is going on in the other shop. But under the smoke screen of the V8 program, Chevrolet was able to go ahead with its sports-car preliminaries without its rivals waking up to it until it was too late.

If Chevrolet gets the Corvette out in June, it will be something of a triumph for General Motors' technical and procurement genius, because the new car will come out without gumming up the works on preparations for 1954 models. It will be a "plus" model which, if it goes over as expected, will be followed by a much larger schedule for next year. If it fizzles, it can be dropped without too much cost. It must be remembered that Chevrolet once spent \$17,000,000 on a light car which never saw the light of day. The Corvette, were it dropped tomorrow, would represent only a fraction of this cost.

Kaiser-Frazer is due with its plastic car next month. It will be a near-miracle if it accomplishes this schedule. Chevrolet has taken away one of its best plastic sources.

The power-steering movement is spreading all through the industry. It will be even more prevalent in the next models.

First sign of a trend toward the merchandising of power steering as a garage-installed accessory (as opposed to present factory installation) came from the Monroe Auto Equipment Co. Its hydraulic power unit replaces the draglink in the steering linkage. It is a direct-acting type with fewer parts than previous units—and it will probably sell for much less than present units. If it works out, you will be able to drive into a garage with your car (new or old) and have them install power steering.

Chrysler is getting set to produce its own unit. Present power-steering equipment in Chrysler cars is Gemmer-built. It provides full-time power steering as opposed to the General Motors' system that requires the driver to exert the first four pounds of effort himself. Unconfirmed rumor has it that the new Chrysler-built unit may abandon the full-time steering and move toward the General Motors type. If so (and this is strictly rumor), it will be a complete switchover for Chrysler which has been describing the General Motors system as "parking only" power steering.

The pricing situation should clear itself in the near future. If there is any tendency for other makers to drop prices following the lead of Chrysler Corporation, it will be after July 1. That is when the pinch is expected to show in new-car sales.

Used cars hold the key to maintaining high-production rates in the industry. They have not moved the way they should this season. Dealers may ask factories to restore the old-time devices (like "junkie" bonuses) for speeding prewar cars to the scrap pile. This is a way of getting rid of a lot of cars still in use. The factory gives the dealer a bonus for each car he scraps instead of resells. It was used in the '30s to stimulate sales and may come again if production stays up at record levels.



## WHAT'S NEW FOR

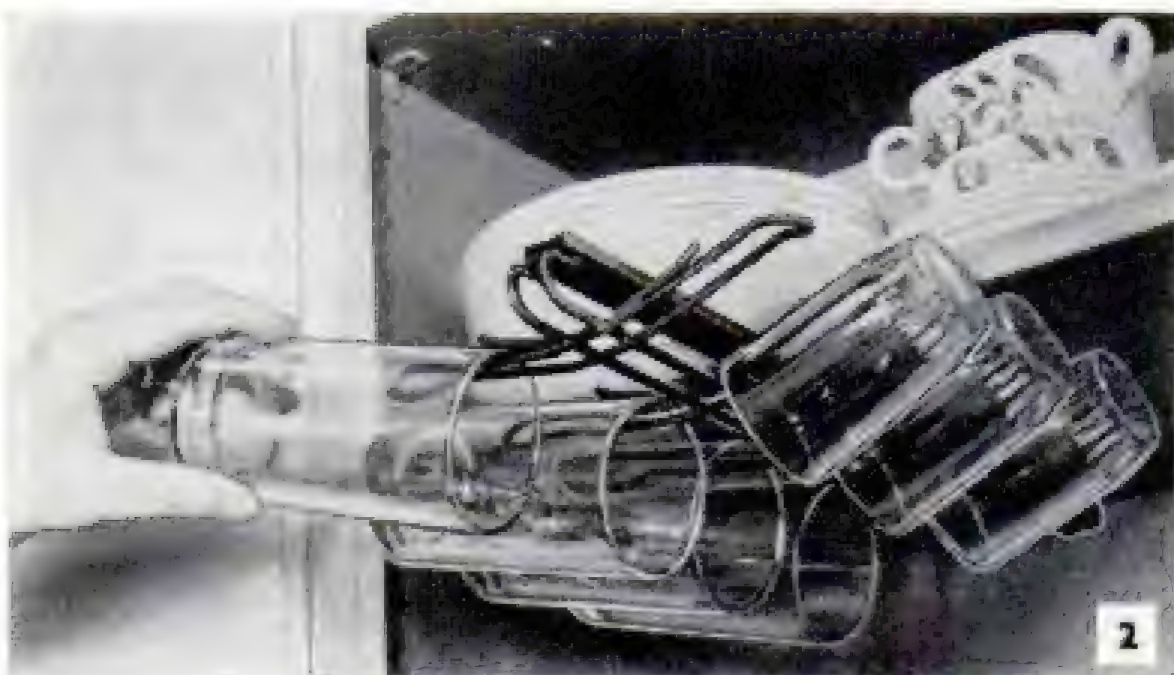
# Your Home

Four pages of household innovations



**1. COMPACT DISHWASHER** built into gas range saves space in small kitchens. Hidden inside stove most of the time, it automatically washes dishes in extended or inserted position, can be wheeled away from the stove for use anywhere within reach of an electrical outlet and faucet

**2. TUMBLER HOLDER** mounts on underside of cupboard shelf, holds eight glasses of various sizes in compact, out-of-the-way arrangement, pulls out when glasses are to be stored or removed. Strong rubber-coated clamps hold glasses separately and securely, prevent chipping and scratching

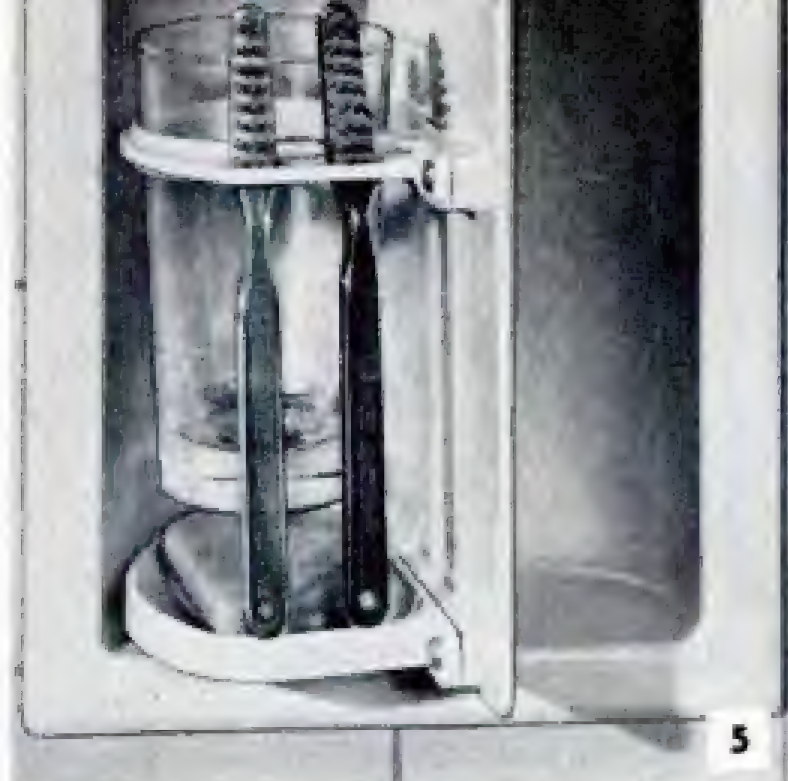


**3. AEROSOL DUST CATCHER** is sprayed on dust mop or cloth from pressurized can, picks up dust "like a magnet," converts it into heavy lint which shakes off easily and neatly into newspaper or wastebasket — without dust scattering. Dust mop needs to be treated only once every 10 days or so

**4. PORTABLE UNIT** small as a hassock humidifies air in winter, dehumidifies it in the summer, plugs into any standard electric outlet. Electric heater inside plastic water container evaporates three gallons of water a day. In summer, water is removed from air by condensation coils



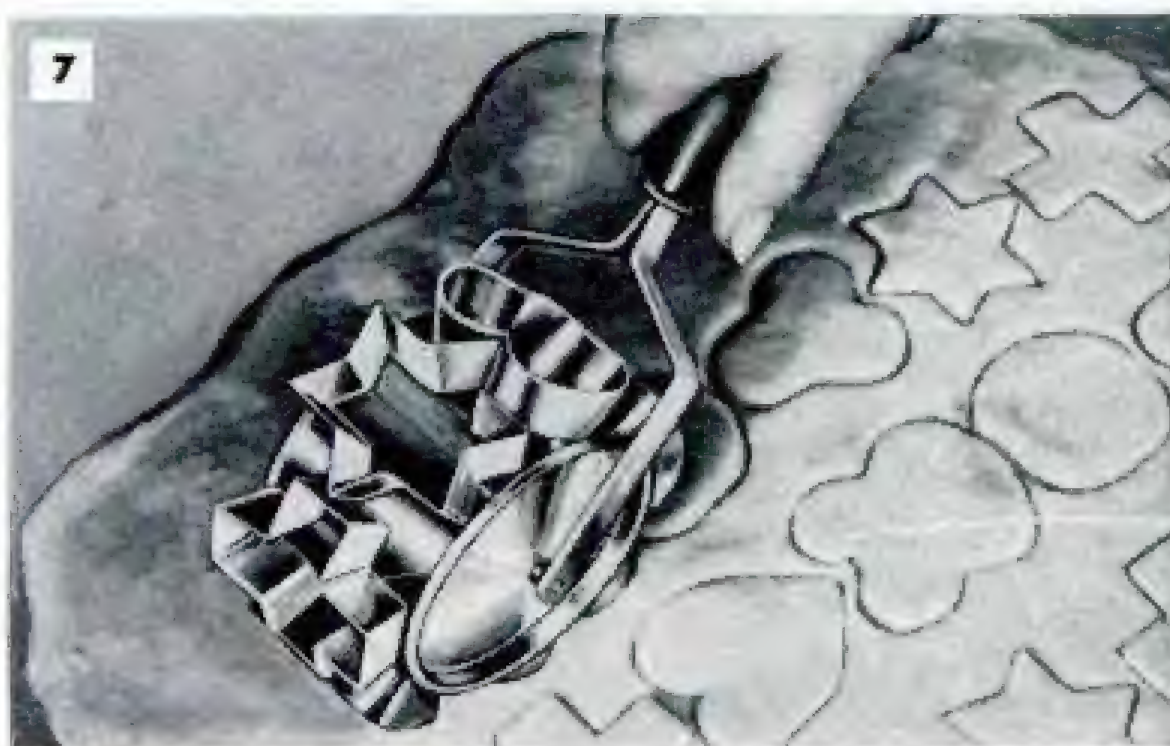




**5. DISAPPEARING HOLDER** for soap, toothbrushes and drinking glass swivels inside pocket recessed in bathroom wall. Touch of the panel carrying toilet items revolves them out of sight and away from dust, leaving smooth panel flush with wall. Porcelain finish makes for easy cleaning



**6. SASH HOLDER** replaces a broken sash cord and holds window firmly in any vertical position, permits easy sliding and stops all rattle. The fixture slides between sash and jamb and is fastened by two screws without removing window. Flat steel spring presses against window jamb



**7. COOKIE CUTTER** forms six different shapes in a row as it is rolled swiftly over a sheet of dough. Large handle fixed to axle of rotating section allows firm grip and steady pressure. Sharp, sturdy pattern cutters slice through nuts and raisins, ore mounted on removable drum

*More on pages 112 and 113→*

**8. DECORATIVE TABLE** hangs on wall when not in use. Framed underside of table top forms a shadow box around iron knick-knack shelf which serves as outside support when table is in down position. Hinged to wall, table is unhooked at top and swings down for use. Iron shelf forms sturdy leg







# WHAT'S NEW FOR Your Home

*Continued from page 111*

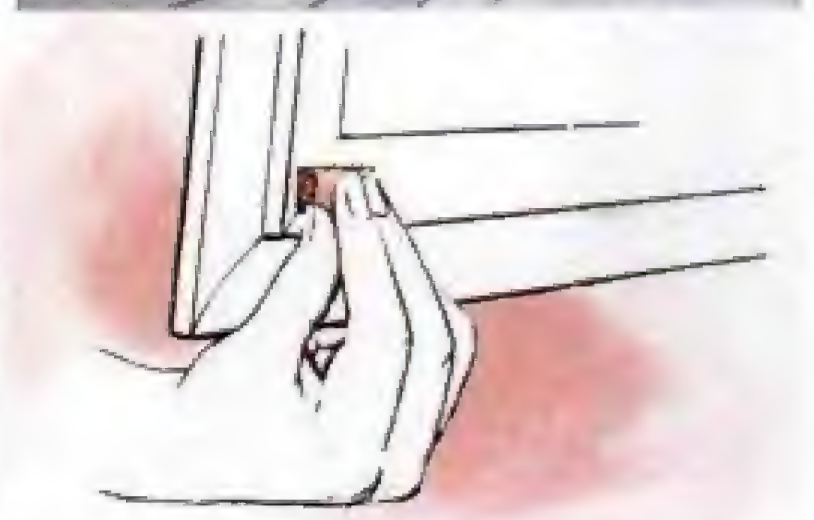
**9. SCRATCHPROOFING PAD** carries its own adhesive, is applied by removing the gauze backing, pressing cloth in place and then trimming to fit. The green or brown flannel cloth forms protective surface on bases of lamps, figurines and bookends

**10. PLASTIC SCOOP** designed for ice cream, cottage cheese and other foods contains a hole in the bottom which is closed like a trap door by the pusher end of an S-shaped lever. Flick of the lever ejects food in neat ball. Lever then springs back



**11. INDOOR BARBECUE** consists of a motor-driven spit which is mounted in a new electric radiant oven. Small turkeys, medium hams and chickens are turned for even broiling. With unit removed, oven is used for broiling or roasting

**12. RUBBER TABS** placed on underside of picture frame or mirror permit air to circulate freely behind picture, ending wall smudge. Self-adhering foam-rubber tabs are skidproof, keep picture straight at all times, protect wall from scratches



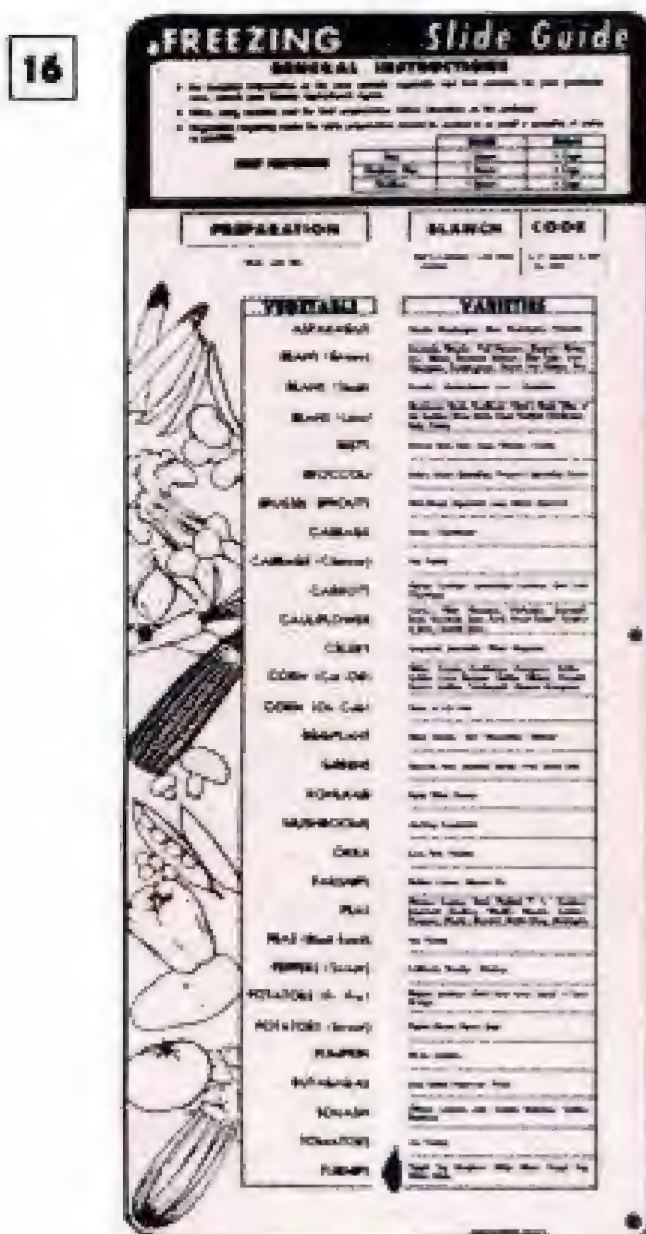


**13. TRANSLUCENT AWNING**, designed for year-round use, stops heat and glare but permits the passage of soft, diffused light. Its plastic panels, 5½ inches wide in alternating colors of red and green, slide in and out of slots for easy cleaning and replacement. Lightweight and easy to handle, the structure has an aluminum and steel frame and it reportedly can be assembled, bolted and erected in 30 minutes

**14. BOTTLE OPENER** opens any size of jar or bottle and completely reseals crimp tops. Hook on top removes bottle caps. Adjustable gear-locked jaws and nonslip teeth on bottom exert heavy pressure to unscrew lids or seal bottles by recrimping caps. Projection at base of tool is used to jimmy open catchup-bottle caps and may even be used to open paint cans. Made of heavy chrome-plated steel, it resists stains

**15. PATTERN MARKER** eliminates needle, thread and pins, saves professional and home dressmakers' time. Made of plastic, the device is tong-shaped, scissor-handled. Chalked points are placed over perforations in the pattern and light pressure applied to the handles as marker is directed along pattern. Chalked dots appear on both sides of the material regardless of its thickness or thinness, serve as clear cutting guides

**16. FREEZING GUIDE** tells you how to prepare almost any kind of vegetable or fruit for quick freezing. Tab is moved up or down until arrow points to food you want to prepare, and instructions appear automatically. Complete information on more than 60 fruits and vegetables includes tips on what kinds to buy. The handy index is small enough to be hung up on the wall to provide instant, reliable information







In two minutes the lightweight trailer, right, is converted into a comfortable two-room camp, above

## Aluminum Sports Trailer Sleeps Four Persons

It takes only two minutes to open a compact two-wheel trailer into a comfortable tent-trailer combination that sleeps four persons. Weighing less than 1000 pounds, the trailer is only 44 inches high and creates no towing problem even with small cars. The upper rear section of the aluminum



trailer body swings up and over to form an insect and water-proof floor. A duck tent forms the roof and side walls. The trailer comes equipped with twin beds, storage for two extra cots and a two-burner bottled-gas stove with small room heater optional.



## Develop Automatic High-Altitude Suit

Full protection for pilots flying above 50,000 feet is provided by a new rubber and Plexiglas suit that has its own automatic oxygen and pressure systems. Developed by the B. F. Goodrich Company for the Navy, it has already been successfully tested at 70,000 feet in a pressure chamber. It offers pilots more mobility than any previous suit of its kind. Even if the plane's oxygen supply is damaged at 100,000 feet or higher, the suit contains enough pressure and oxygen to permit the pilot to fly down to lower altitudes where the atmospheric pressure is high enough for him to survive. The suit takes over automatically in emergencies, pressuring itself and furnishing oxygen without any action on the pilot's part.

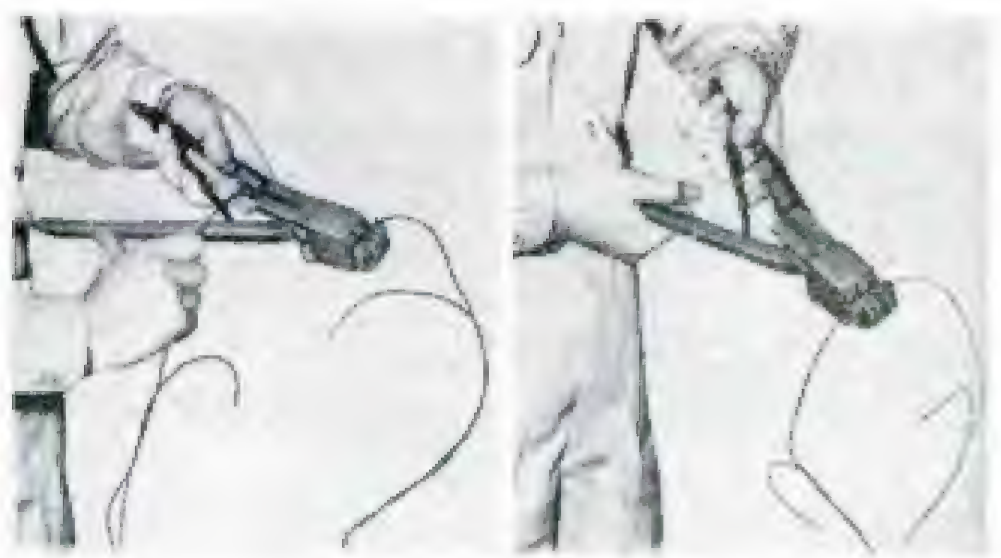
¶ The planet Saturn, with its rings and satellites, is 95.33 times as bulky as the earth.





U. S. Army photos

Soldier holding wire with two completed splices. Crimped connector cartridge is shown at the right



Stripper on handle of tool, left, scrapes ends of wire. Bare wire ends are then put into cartridge and crimped. Below, tool and carrying case



## Mechanical Wire Splicer Cuts Exposure to Enemy Fire

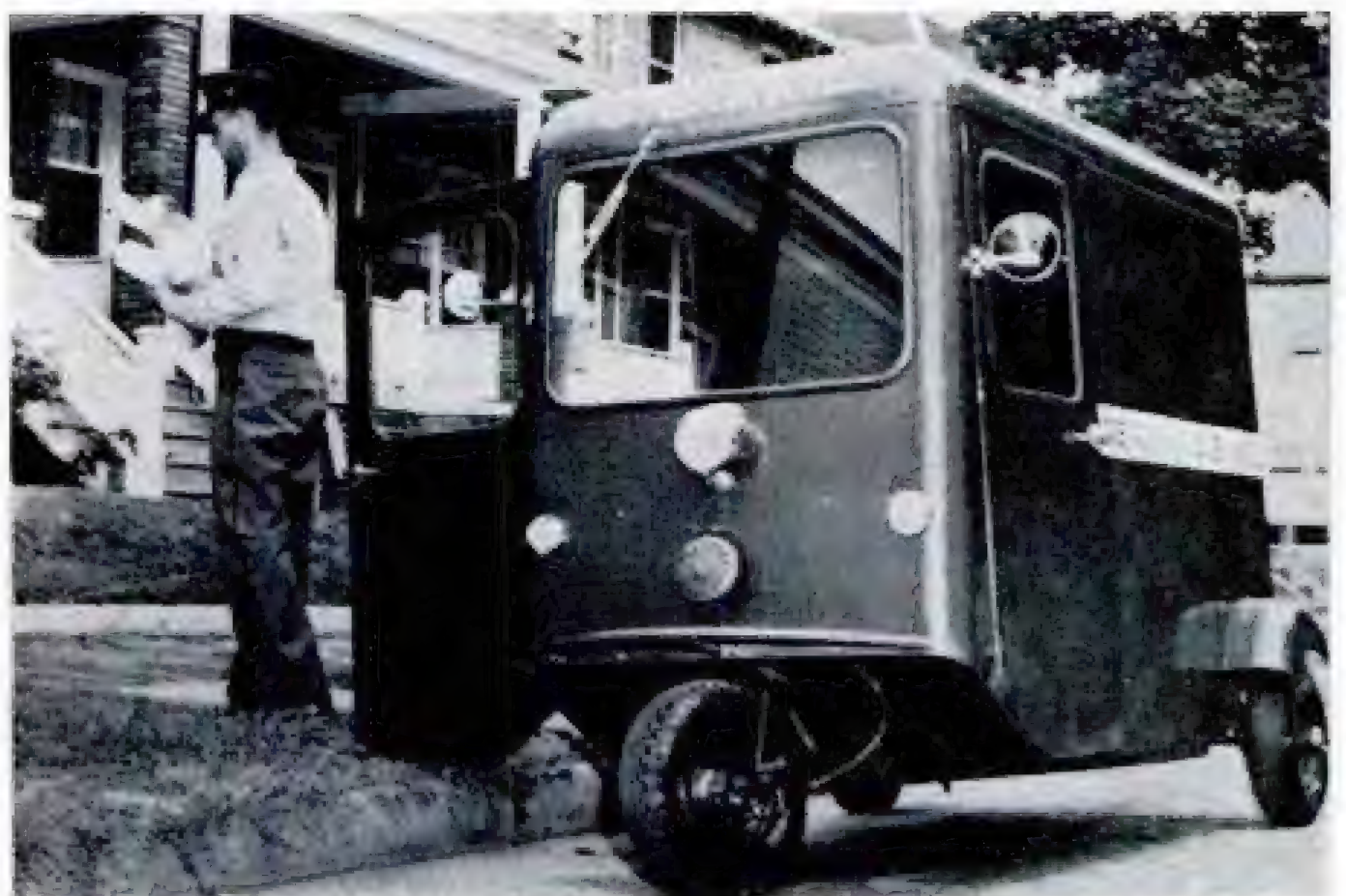
Perfect wire splices are made in less than 30 seconds with a lightweight tool developed by the Signal Corps and Aircraft-Marine Products, Inc. It reduces by several precious minutes the time a repairman is exposed to enemy fire. The new tool looks like a long pair of pliers. In place of ordinary jaws, it has a small case which feeds 10 repair cartridges in triggerlike fashion. Instead of scraping off the insulation from both ends of the wire by hand, the repairman puts the broken ends of the wire in a stripper attached to the handle and

squeezes. Then he feeds the bare wires into each end of a connector cartridge in the jaws of the tool and squeezes again to complete the splice. Both ends of the cartridge and its center are crimped together, making a perfect insulation and waterproofed joining. The hand-repair method takes a trained man three to four minutes under perfect conditions.

## Postman Gets a Lift With Experimental Three-Wheel Motorcycle

United States postal authorities are conducting tests on a variety of small vehicles for the use of postmen. Among the models being tested is a three-wheel motorcycle with an enclosed rear compartment. In all, 25 different models are in the experiment, ranging from caddy-type carts such as are used on golf courses to light trucks.

Applied hot, a long-wearing plastic stripe may replace paint in the marking of traffic lanes.





## Homemade Lift Eases Wheel-Chair Patient Into or Out of Car



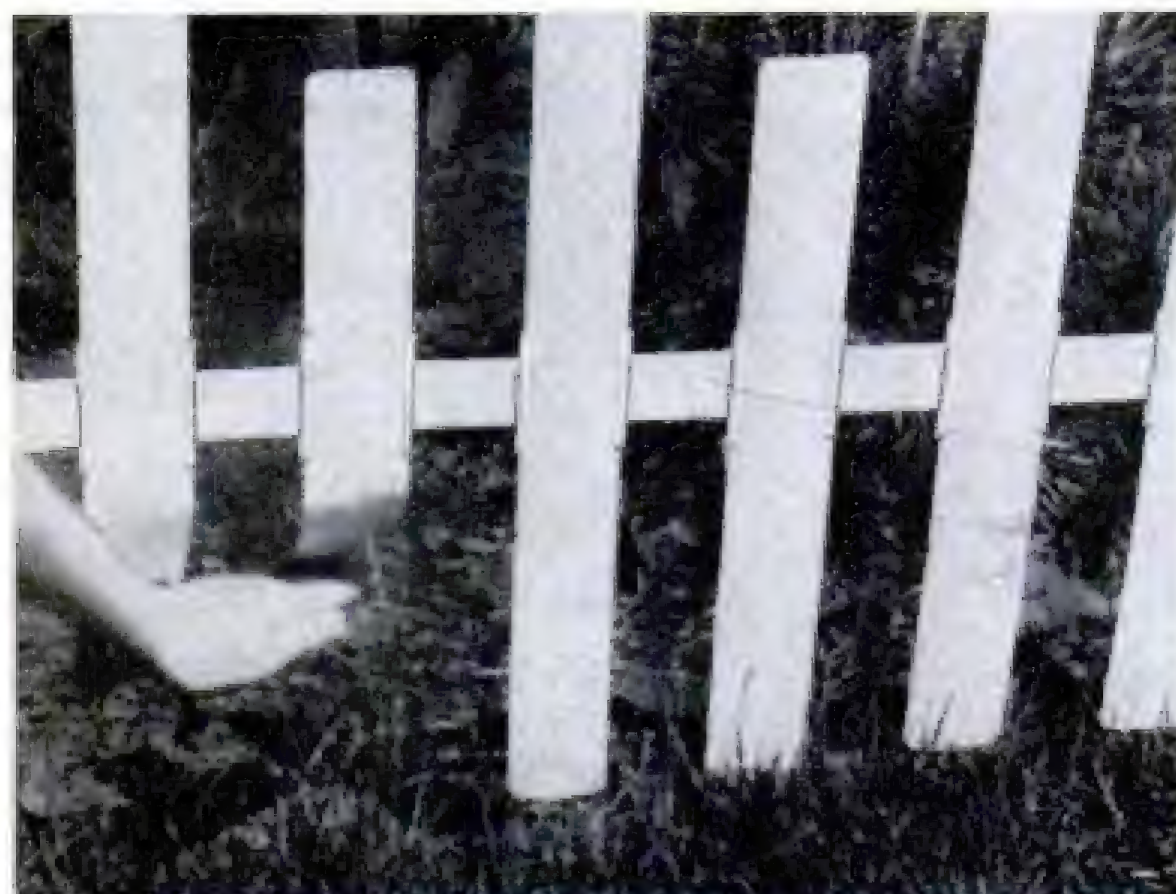
Designed to move a wheel-chair patient into or out of a car, a homemade lift takes only minutes to install. It consists of two main sections. A pipe above the front seat is suspended on the driver's side by a hook out the window and over the drip edge, and on the right side by two arms connected to suction cups which rest on the roof. A second pipe which slides inside the first carries the lifting mechanism. Patient sits in canvas slings and is hoisted to proper level by a crank-operated winch. Then patient is easily pushed inside the car.

## Antigrowth-Chemical Treatment for Lawn Edges Keeps Grass Short

Now you can eliminate the hardest part of grass-cutting—hand-trimming the strips and edges along flower beds, driveways and other hard-to-cut places—with a chemical which retards the growth of grass for a full season. Dissolved in water, the substance is applied to the grass with a garden watering can and given a trimming a week later. The grass then stays short for the full season. Eventually, the homeowner may be able to treat his entire lawn with the chemical if a suitable low-pressure sprayer is developed to give even distribution of the substance. It is harmless for children, pets, flowers and bushes and a one-ounce package is ample for the average home lawn.



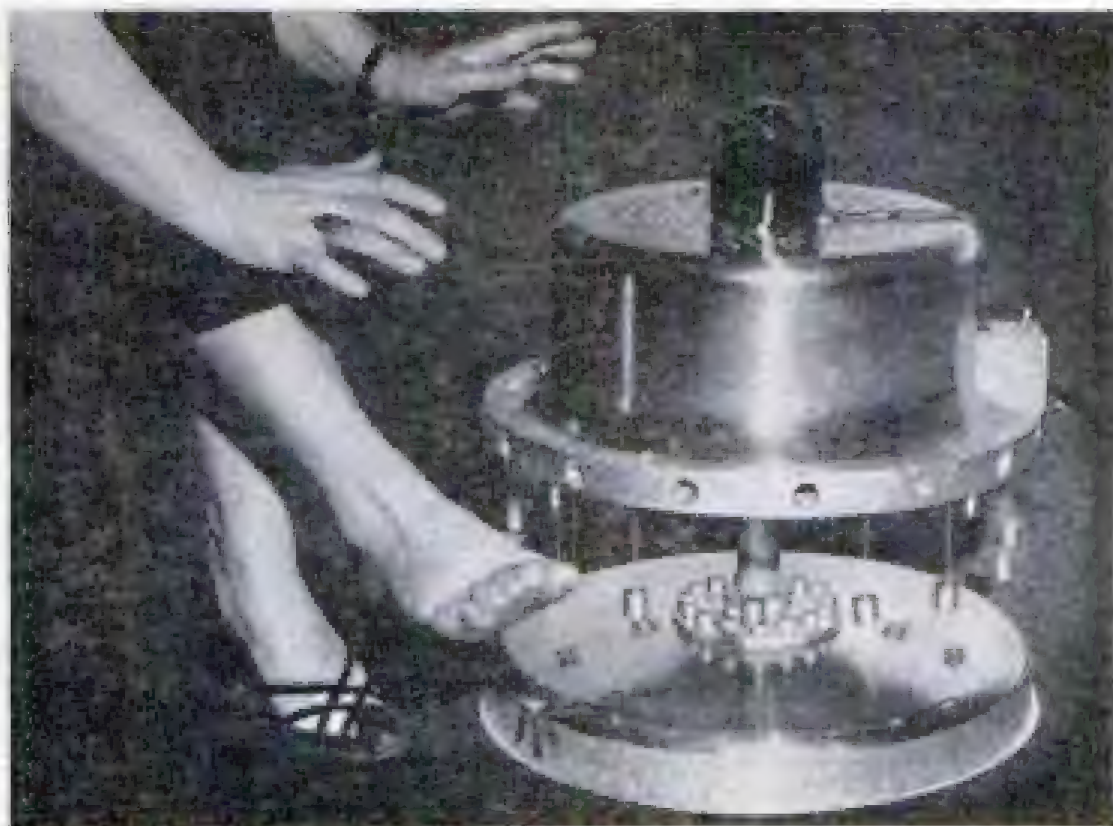
## Quickly Erected Flexible-Steel Pickets Make Unbreakable Fence



Simple to put up and easy to maintain are the claims for an all-steel picket fence. Posts that support the fence are easily pushed into the ground and a horizontal crosspiece attached. The spring-steel pickets then slip into pockets on the crosspiece. There is no nailing or bolting required. The pickets have a baked-enamel finish and do not require painting. A variety of colors is available. Lawn trimming is simplified; flexible pickets push aside for mowing.

☐ Insects cost the United States a total of \$4,000,000,000 a year in crops and livestock.





Above, with rods and pedestal removed, drier is foot warmer. With heat off, it's a cooling fan. Right, it is portable

## ***Portable Electric Clothes Drier Has a Variety of Uses***

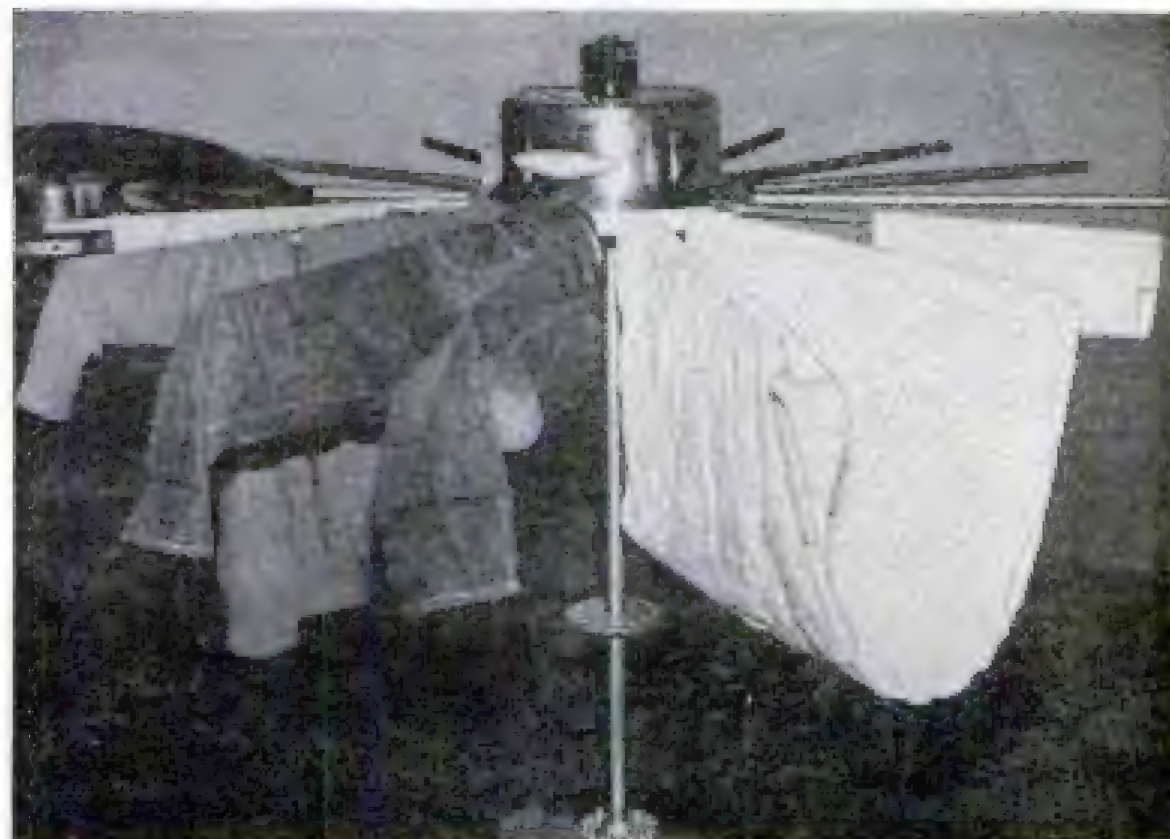
IF YOU'RE LOOKING for a clothes drier that can do a variety of jobs, then Russell R. Braman of Shawnee, Okla., has the one you want. It not only dries clothes, it will also warm a room on cool days, dry hair after a shampoo, serve as a cooling fan on hot days and, with a few changes, can be used as a safe, dependable chicken brooder.

The arms of the electric drier, over which the wet clothing is draped, have a total length of 30 feet, providing ample "clothes-line" in wet or dry weather. The whole unit folds into a small space for storage in a hall closet and takes up less space than a vacuum cleaner. It is made of aluminum and weighs about 25 pounds, making it light enough to move around easily. The manufacturer claims that it will dry clothes just about as fast as the average washing machine will turn them out.



The top of the drier contains a small electric motor and fan. A heating coil in the top keeps the circulating air well over 110 degrees. This heated air is forced through the hollow arms and out a series of small holes into the wet clothing. When used for other purposes the arms can be removed and the air flow controlled by small plugs, if necessary. It produces about 1500 BTUs and costs four to six cents per hour to operate.

Fan and heater are in top. Plugs block openings to divert flow of air. Right, the drier has 30 feet of "line"





# The OWNERS REPORT on

EXACTLY  
AVERAGE: 15.5 M.P.G.

## POPULAR MECHANICS OWNERS POLL CONDUCTED BY FLOYD CLYMER

1. I own a 1953 Buick: Special ☐ Super ☒ Roadmaster ☐  
 2. I use regular gasoline ☐ Premium (high test) gasoline ☒  
 3. Average gasoline mileage in city: 14 m.p.g.; in country: 15.5 m.p.g.  
 4. Oil consumption: One quart every 500 miles. I change oil every 1000 miles (approx)  
 5. My Buick is equipped with: Conventional 3-speed transmission ☐ Twin-Turbine Dynaflo Drive ☒  
 6. If you own a Buick V8, what is your opinion of the new V8 engine?  
 Excellent ☐ Good ☒ Fair ☐ Poor ☐ Comment: OIL CONSUMPTION IS BAD BUT AM TOLD BY DEALER IT WILL IMPROVE

Speedometer reading 3700

BIG COMPLAINT

BRAINTREE, MASS.,  
SALES MANAGER

79% AGREED

7. If your Buick has Power Steering has it proved to be worth the added cost?  
 Yes ☒ No ☐ Comment: Sold on power steering for big cars  
 8. Roadability at high speeds: Excellent ☒ Good ☐ Unsatisfactory ☐  
 9. Maneuverability in traffic: Excellent ☐ Good ☒ Unsatisfactory ☐  
 10. If you have Dynaflo comment on: a. Acceleration from 0 m.p.h. Excellent - will beat anything  
 b. Acceleration from 50 m.p.h. good c. Performance in traffic very good  
 11. Cruising speed of your Buick? 65 m.p.h.

WILMINGTON, DEL.,  
SALESMAN

## POPULAR REASONS FOR BUYING

12. Reasons for buying a Buick: I like styling and riding qualities but there is room for improvement  
 13. Rate these points:  
 The 12-volt electrical system: Like ☒ Acceptable ☐ Dislike ☐  
 "Step-on" parking brake: Like ☒ Acceptable ☐ Dislike ☐  
 Horsepower output: Like ☐ Acceptable ☒ Dislike ☐  
 Riding qualities: Like ☒ Acceptable ☐ Dislike ☐  
 Exterior body styling: Like ☐ Acceptable ☒ Dislike ☐  
 Visibility, forward: Like ☐ Acceptable ☒ Dislike ☐  
 Visibility, rear: Like ☐ Acceptable ☒ Dislike ☐  
 Ease of parking: Like ☐ Acceptable ☒ Dislike ☐  
 14. Specifically, what are your complaints? Won't take curves at high speed or build up enough torque fast enough in drive when passing fast-moving cars. Poor gasoline mileage

CLEVELAND, OHIO, BUS DRIVER

48% AGREED

15. Have you ever owned a Buick before? Yes ☒ No ☐  
 16. Would you buy another Buick? Yes ☒ Possibly ☐ No ☐  
 17. How is your dealer service? Excellent ☐ Good ☒ Average ☐ Poor ☐  
 18. An overall rating of your Buick: Excellent ☒ Good ☐ Average ☐ Poor ☐  
 19. What improvements do you want in your next car? quieter power steering Improved acceleration

LONG ISLAND ENGINEER

write additional comments here:

I think it's time they changed their body style along with clearing the knobs off the dash.  
 Wouldn't get it again unless they find a way to cut it out at 40 m.p.h. Too tricky after 60 m.p.h.  
 Power steering is lousy at high speed.



# the '53 BUICK V 8

By Floyd Clymer

**B**IG NEWS AT BUICK for 1953 is its V8 engine with the highest compression ratio in the business. The V8 owners responding to the *PM* survey mixed praise with criticism in describing the new power plant.

Returned questionnaires prove the value of Buick's slogan, "When better cars are built, Buick will build them." Owner after owner gave this quotation as the reason for buying a Buick.

"I have driven and owned nearly every other make of car since 1930," wrote a Lehi, Utah, resort maintainer, "but have found that Buick still is the best buy and will always believe that 'when better cars are built, Buick will build them.'"

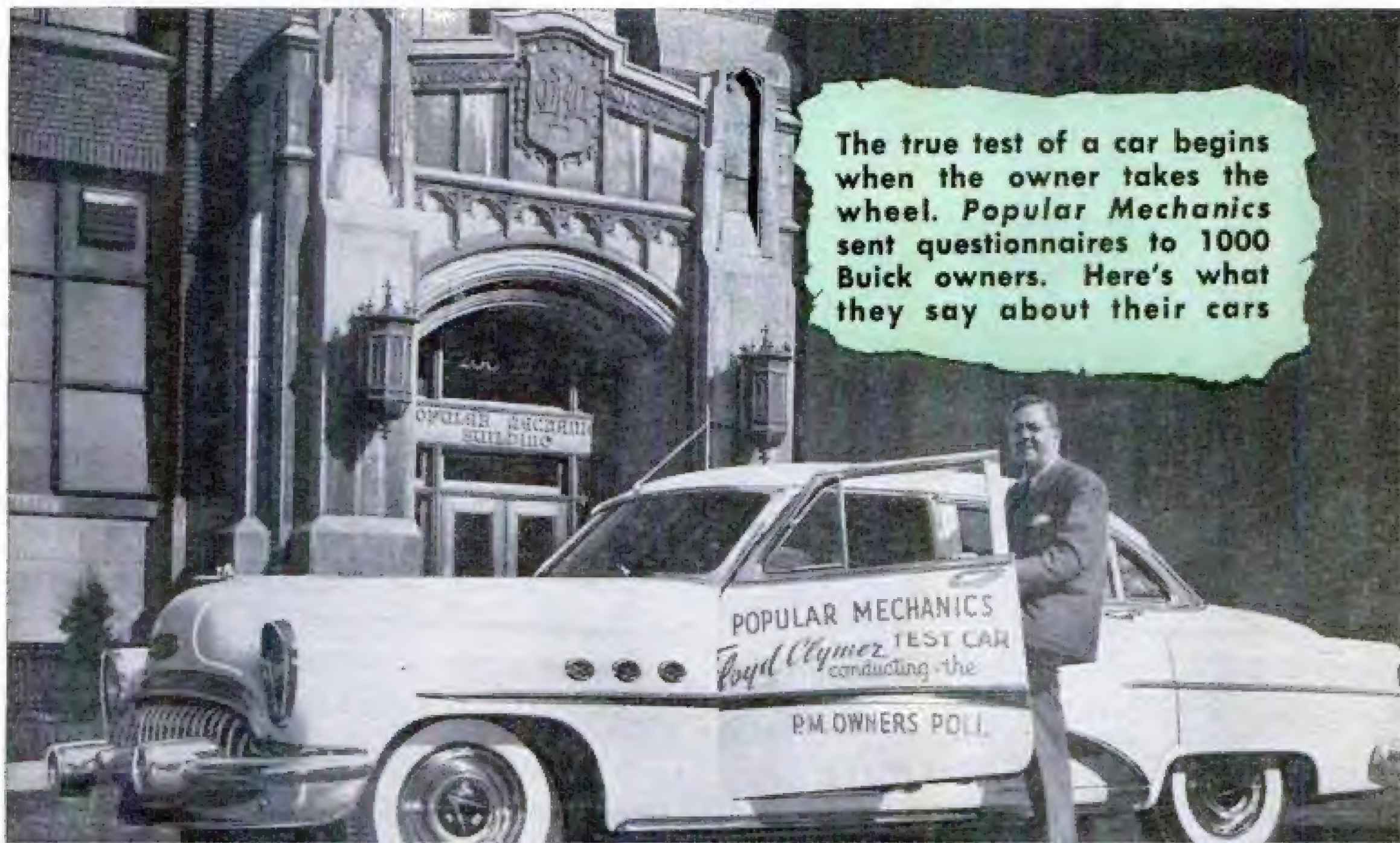
"The reason I purchased a 1953 Buick," wrote a circus electrician, "was because of the merits of a 1951 model I owned. With it I pulled a 28-foot trailer all summer over all kinds of roads and mountains and never was stuck once. Dynaflo is the only thing for pulling it."

A Hastings, Neb., realtor wrote: "Tremendous improvement in Dynaflo and with power steering it is as easy to park as the smallest car."

An Atlanta, Ga., owner said his 1953 Super is his 34th Buick! That sets a record for the surveys to date.



Above, the Super climbs a steep, rutted hill in a test of both power and traction. Below, Floyd Clymer stops off at the *Popular Mechanics* building in Chicago on his test drive from Detroit to Denver



The true test of a car begins when the owner takes the wheel. *Popular Mechanics* sent questionnaires to 1000 Buick owners. Here's what they say about their cars



# Percentages from PM Poll of Owners

Buick Special owners reporting: 47%

Super V8 owners: 37%

Roadmaster V8 owners: 16%

## All Buick Owners Reporting

Average speedometer mileage.....	2117
Roadability excellent.....	69%
good.....	29%
unsatisfactory.....	2%
Maneuverability excellent.....	71%
good.....	27%
unsatisfactory.....	2%
Dealer service excellent.....	44%
good.....	26%
average.....	20%
poor.....	10%
Previous Buick owners.....	79%

## RATINGS OF PARTICULAR FEATURES

	Like	Acceptable	Dislike
Visibility forward.....	91%	9%	0%
Riding qualities.....	89%	10%	1%
Step-on parking brake.....	88%	10%	2%
Visibility, rear.....	86%	9%	5%
Horsepower output.....	81%	19%	0%
Exterior styling.....	80%	19%	1%
12-volt system.....	79%	20%	1%
Ease of parking.....	74%	24%	2%

## CHIEF PURCHASE REASONS

(in order of frequency)

1. Previous Buick ownership
2. Purchase conditions (price, trade in, dealer relations, etc.)
3. Mechanical features (engine, transmission, etc.)
4. Riding qualities
5. Styling features (interior or exterior)

## IMPROVEMENTS DESIRED IN NEXT CAR

(in order of frequency)

1. Increased fuel economy
2. Quieter engine or transmission
3. Improved body fitting
4. Easier steering (power-assisted)
5. Minor styling improvements
6. Better chrome or paint

## Buick Owners by Engine Type

	Special 8	V8 models
Use premium gasoline.....	66%	96%
regular gasoline.....	34%	4%
Average gasoline mileage—		
city.....	13.8 m.p.g.	12.2 m.p.g.
country.....	17.0 m.p.g.	15.5 m.p.g.
Add no oil per 1000 miles....	87%	44%

## Special 8 V8 models

Add one quart or more per 1000 miles.....	13%	56%
Add 3 quarts or more per 1000 miles.....	0%	21%
(Most owners reporting had driven their cars less than 2500 miles so excessive oil consumption may be due to break-in)		
Power-steering owners reporting		
Unit worth the extra cost		79%
Unit not worth extra cost		21%
Over-all rating of V8 engine		
Excellent.....		61%
Good.....		20%
Fair.....		12%
Poor.....		7%
Will buy another Buick?		
Yes.....	72%	70%
Possibly.....	26%	23%
No.....	2%	7%
Over-all rating of car		
Excellent.....	50%	48%
Good.....	45%	36%
Average.....	5%	11%
Poor.....	0%	5%
Dynaflow acceleration		
From 0 m.p.h.: Excellent	50%	46%
Good ..	38%	39%
Fair ...	8%	10%
Poor ...	4%	5%
From 50 m.p.h.: Excellent	40%	63%
Good ..	51%	30%
Fair ...	9%	6%
Poor ...	0%	1%
Dynaflow performance in traffic:		
Excellent	63%	49%
Good ..	35%	43%
Fair ...	1%	3%
Poor ...	1%	5%
Most frequent objections of Special owners		
Gasoline economy poor.....		15%
Noisy Dynaflow.....		9%
Noisy engine.....		8%
Steering and handling.....		7%
Forward vision.....		4%
Acceleration.....		4%
Poor chrome.....		4%
Most frequent objections of V8 owners		
Oil consumption high.....		27%
Noisy engine (ping, tappets, etc.)..		23%
Gasoline economy poor.....		21%
Noisy Dynaflow.....		7%
Interior finish and details.....		7%
Rear vision.....		4%



Power steering is worth its cost, say 79 percent of those who have it. Clymer reports that the upper half of horn ring blocks driver's view of speedometer





Clymer does a fast circle with wheels cramped to left. Test proved that the Super has good stability

Of the owners reporting, 79 percent are previous Buick owners. One of the characteristics of American car buyers that the PM poll has pointed up is the tremendous loyalty of owners toward car makes. Many owners even give parental ownership as reason for buying a certain make! But none was so terse about it as a Lynn, Mass., restaurant owner who gave only one word as his reason for buying a Buick: "Habit."

Of the V8 owners, 81 percent rated the new engine as either excellent or good; 19 percent described it as fair or poor.

Owners of the Special series (which retains the veteran straight-8 engine) had fewer complaints than the Super and Roadmaster owners. Asked for an over-all rating of their cars, only a tiny 5 percent of the Special owners said average or poor. Of the V8 owners 16 percent rated their new cars over-all in one of these categories.

Buick owners came up with a surprise when asked about power steering. An astonishing 21 percent of those whose cars have power steering said it is not worth the added cost! This contradicts the enthusiasts who say that once you've used power

steering you'll never go back to the old-fashioned muscle method.

A Kansas City engineer wrote, "I made my own tests on the new Dynaflo as against a friend's Special with the old Dynaflo. There is a lot of improvement. I like my Special except for the torque drive—too much unsprung weight at rear end. Buick's power steering is the best yet!"

Here are some comments by owners of 1953 Roadmasters:

"The only car that could compare with the 1953 V8 Roadmaster in performance was the 1937 Cord. It is the most dependable car ever built."—South Ogden, Utah, railroad conductor.

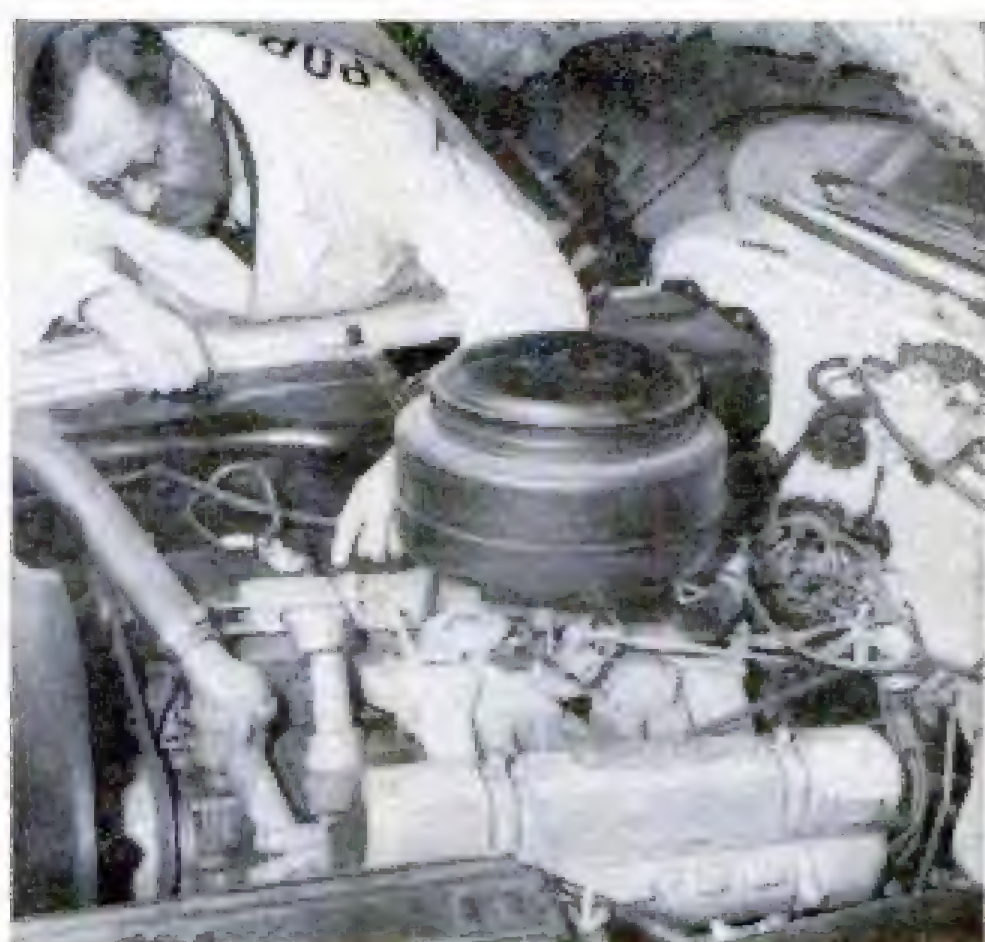
A Rock Falls, Ill., retailer gave as his reasons for buying a Buick its "investment and high resale value."

Buick gives a "comfortable ride along with conveniences without cost of frequent repairs," according to a Hamilton, Ohio, woodworker.

A toolmaker in Elyria, Ohio, says about everything that can be said for a car when he praises its "roadability, riding qualities, style, dependability and good trade in."

Step-on parking brake holds car on steep hill. Only two percent of owners disliked the step-on feature

Buick's V8 was rated excellent or good by 80 percent of owners. Big complaint was oil consumption





## ACCELERATION TEST

¼ mile	21.4 sec.	
from zero	20.2 sec.	—Drive and Low
½ mile	32.1 sec.	
from zero	31.4 sec.	—Drive and Low
0 to 30 m.p.h.	4.9 sec.	—Low only
0 to 60 m.p.h.	15.4 sec.	—Drive only
	14.5 sec.	—Low and Drive

Top speed (by speedometer) ..... 113-115 m.p.h.  
Actual top speed, about 8% less (speedometer variation)  
(In tests using both Low and Drive shift was made at about 30 m.p.h.)

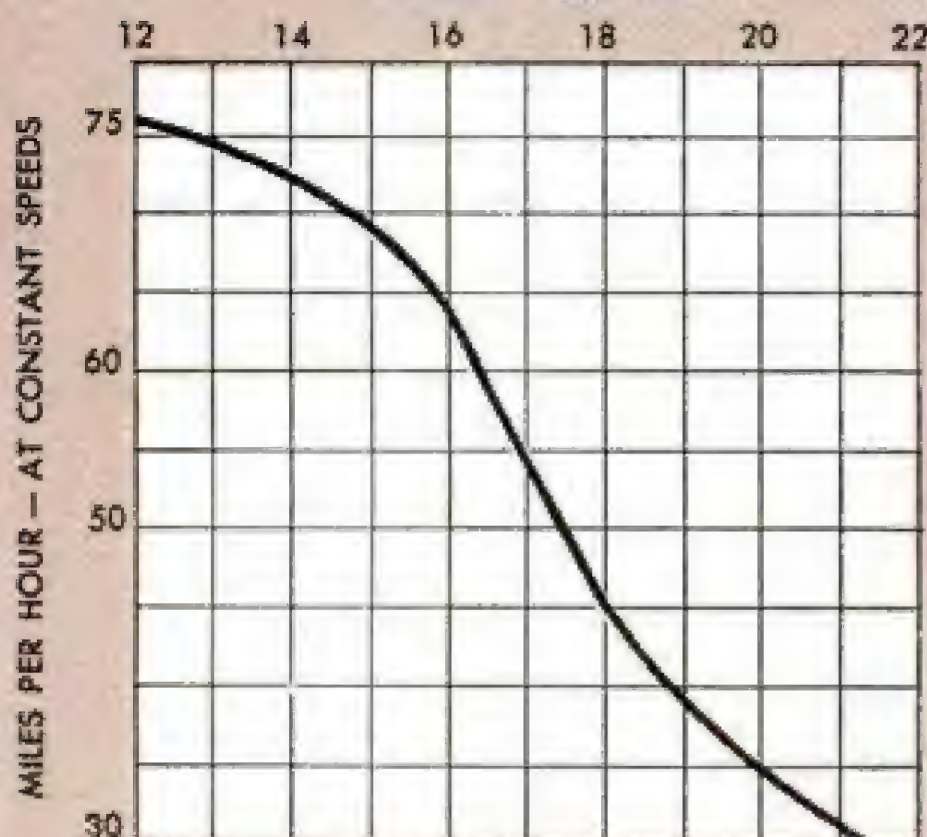


Backup lights are still in rear bumper. Parking lights are out of front bumper this year

## ECONOMY TEST

1953 BUICK SUPER V8 4-DOOR SEDAN  
WITH TWIN-TURBINE DYNAFLOW DRIVE

MILES PER GALLON



### Constant-Speed Mileage

At constant 30 m.p.h.	21.2 m.p.g.
At constant 50 m.p.h.	17.4 m.p.g.
At constant 60 m.p.h.	16.5 m.p.g.
At constant 75 m.p.h.	12.6 m.p.g.

### Cross-Country Mileage

Flint, Mich., to Chicago, Ill. (new car, traffic)	16.1 m.p.g.
Chicago to Kansas City, Mo. (strong headwind)	16.5 m.p.g.
Kansas City to Denver, Colo. (Regular gasoline used to Kansas City, premium gas from Kansas City to Denver)	19.2 m.p.g.

A Paramus, N. J., textile executive said he bought his Buick Super because he "likes overhead valves and Dynaflow and styling. Also the various small accessory items which are well planned. Feel price is moderate compared with other similar-size makes."

A Rochester, N. Y., owner gave "good performance and exceptionally reasonable upkeep on previous Buick" as reasons for buying a 1953 Super.

"The Buick Special is a lot of car for the money. It closes in on the low-price three in price, yet has the weight and size of a big car."—Camden, N. J., minister.

"My Special uses more gas but I find it cheaper in the end to own and operate than the previous low-price car I owned. Brakes fade some in mountain driving, but Dynaflow is far better in mountains than those 'jerk-o-matic' transmissions on some cars."—Boulder, Colo., farmer.

"The new Dynaflow adds pep and economy to the Special. Best car built for my money."—Cheyenne, Wyo., salesman.

But not all Buick owners are satisfied. As with all makes there are complaints. The owners of 1953 Buick models with the V8 engine seem to have many more than the Buick Special owners.

Most frequent complaint made by V8 owners was excessive oil consumption. Of these owners, 27 percent listed that objection to the new engine. Next most frequent complaint among V8 owners was engine noise, a mixture of tappet-noise complaints and spark-knock complaints. Even with premium gas, there were complaints of bothersome spark "ping." Poor gasoline economy was also given as an objection by V8 owners, but this is a standard complaint of all car owners. Every driver seems to feel he should get more miles per gallon no matter what make of car he drives.

Here are some complaints by V8 owners:

"Noisy, burns oils, gas consumption too high. Doesn't seem to have the rated power."—Paterson, N. J., Roadmaster owner.

"On high-test gasoline, no matter what is done to retard the spark, still have a bad ping in the motor," complains a Chicago businessman.

"Motor pings, noisy valves, easy to get out of tune."—Cleveland, Ohio, appraiser.

"A Buick dealer told me that the '53 models will get more than 18 miles to the gallon and then doesn't do anything about it when I complain."—Tyler, Tex., oilman.

"The engine pumps oil and accumulates carbon rapidly, lowering gas mileage."—Minneapolis, Minn., supervisor.

There were so many complaints of excessive oil consumption that *Popular Mechanics* asked Buick for a statement. Because

(Continued to page 230)





"Duck" takes to the water for a test run. Three hoses can throw hundreds of gallons per minute on a fire

## Army "Duck" Fights Fires Ashore and in Harbor

Firemen of Essex, Conn., cover the water front in a converted Army surplus DUKW that now serves as a highly mobile "fire amphibian." Pooling their skills, the smoke-eaters transformed the "duck" into a compact fire-fighting unit that performs equally well on land or sea. Onto it went special marine fittings and hardware, bilge pumps, navigation and search lights, sirens, ship-to-shore radio, life preservers and anchors. Emergency gear includes first-aid equipment, blankets, axes, boat hooks, pikes, rope, grappling irons, steel cable and a power-operated winch. Heart of the fire fighter is a gasoline pump, located in the stern, that can deliver 500 gallons of water per minute. There's a powerful deck gun in the bow, and three hoses adaptable to water, fog, foam or carbon dioxide. When



water-borne, the eight-ton craft is driven at speeds up to 10 knots by a three-blade propeller. On land, it can speed 60 miles per hour over rough terrain. Already, it's been used to quench fires in shipyards and barnyards, tow disabled yachts to safety, and stop water-front fires that were inaccessible from land.

## Traffic Safety Light on Truck Gives Motorists Signal to Pass



Mounted on the rear of a truck, a red-green signal light tells motorists whether traffic ahead of the truck is "all clear" for passing or congested. The driver operates the signal from a hand switch on the dashboard. Corresponding lights in miniature light up on the switch; thus the trucker knows at all times whether the safety light at the back of the truck is functioning.

☐ Magnesium available in the oceans would cover the entire world's land area to a depth of nine feet.





## Army Stratosphere Chamber Tests Weather Equipment

Simulating pressure and temperature conditions a weather balloon would encounter while rising to 150,000 feet above the earth, a Signal Corps test chamber at Fort Monmouth, N. J., is used to study meteorological equipment. With aluminum lining, foot-thick glass-wool insulation and an outside shell of reinforced nickel steel,

the unit can decrease pressure to  $\frac{1}{1000}$  of an atmosphere and temperature to  $-150$  degrees Fahrenheit. Engineers may watch experiments through a nine-ply, two-foot square glass window set in the huge door. The refrigerating system employed, the Army says, is equivalent to a plant capable of producing 85 tons of ice a day.

## Abrasive Metal Cutter Won't Cut Rubber



Abrasive particles, propelled by gas at the rate of 1100 feet per second—effectively cut hard materials without harming resilient materials such as rubber. In fact, the operator can momentarily stick his hand under the streaming abrasive without injury to the skin. The unit—somewhat similar to the recently introduced painless method of dental drilling with air—can be used to drill, cut, etch, deburr and polish many different materials. The unit uses any inert gas, particularly carbon dioxide as it is most readily available. The unit weighs 42 pounds.

## Watch Tells Sportsmen Best Times for Fishing and Hunting

Sportsmen can coordinate a new watch with local tide conditions to indicate the best times of the day for hunting and fishing. The 17-jewel watch has a small dial which is set to correspond with local tide tables. A pair of pointers then indicates the best times for finding fish or game, as the feeding habits of wildlife are believed to correspond to the various phases of the moon and the tides.

¶ In the United States alone, 10,000 tons of steel wire are used each year in the production of hairpins and bobby pins.







## Wheeled Launching Platform Trains Water Skiers

Novice water skiers achieve success on their first try with a launching platform that gets them off to a balanced start. With skis in the water, the trainee grasps the towline and sits in the middle of a plank supported on each end by small wheels

resting on wooden rails. As the towing boat gathers speed, skier and carriage are propelled forward until a rope stops the carriage and the erect skier skims away from the platform. Plans for the manufacture of an all-steel launcher are now underway.

## U-Boat Detectors Track Whales

British whaling expeditions to the Antarctic are using ultrasonic sound pulses to track down the seagoing mammals. Employing the method developed in World War II for detecting enemy submarines, the ships send out underwater pulses which strike whales and rebound to the ship, revealing the location of the leviathans. The ultrasonic whale finder can follow a whale for distances up to 2000 yards, it is reported.

## Ultrathin Steel Alloy

Sheets of nickel-alloy electrical steel  $\frac{1}{20}$  the thickness of a human hair are filling a specialized demand in electronics. Rugged and reliable, the new metal is finding uses in radar equipment, the "memory" sections of mechanical "brains" and in radio vacuum tubes. It becomes electromagnetized in about  $1/1,000,000$  second. Though it costs only a few cents a foot, per pound it is more expensive than gold.

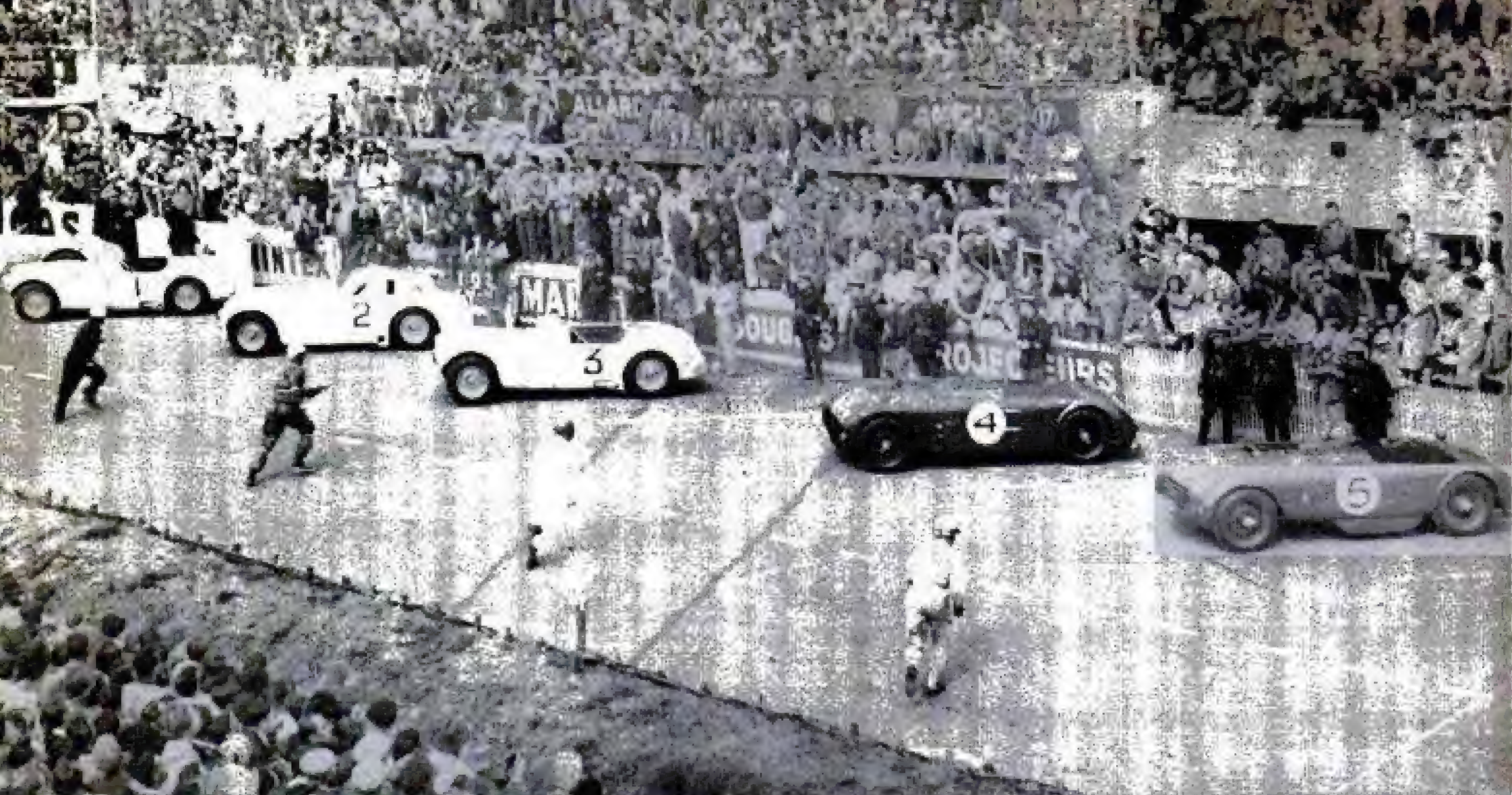
## French Nautical Bicycle Permits Cycling in the Seine

Pedaling down the river on a Sunday afternoon not so long ago, a French inventor demonstrated his method of combining two favorite sports. The nautical bicycle he developed consists of two compartmentalized pontoons joined by a metal framework

with a watery saddle. The operator rotates pedals to drive a propeller. A sail and a jib may be added for increased speed and thrills. Lightweight and easy to operate, the boat adjusts to fit child or adult, and folds into a small package.







Drivers sprint to their cars for the famous Le Mans start. The first three cars, left, are Cunninghams

## *24 Hours of Speed - -*

# WILL AMERICA WIN AT LE MANS?

**E**VERY YEAR on an 8.38-mile circuit of French highway about 150 miles southwest of Paris, men and machines undergo one of the world's great endurance tests—the 24-hour Le Mans Race.

Since 1923, the finest sports cars have put their reputations on the line in a tortuous competition of speed and endurance. So tough is Le Mans that in 1952, only 17 of the 58 starters were running at the end of the 24 hours. Average speed for the winning Mercedes-Benz was 96.67 miles per

hour for the 24 hours from 4 o'clock Saturday afternoon to 4 o'clock Sunday afternoon—its total distance was a fabulous 2320 miles!

So far, America has not won at Le Mans. Closest was the dual-valve Stutz of America's golden sports-car era in 1928. It placed second.

Carrying America's hopes in 1953 will be four cars—two Cunninghams and two Nash-Healeys. Both had entries in 1952 and both did well, but not quite well enough.

Here are the chassis and Chrysler engine of last year's Cunningham. This year's is lower and lighter





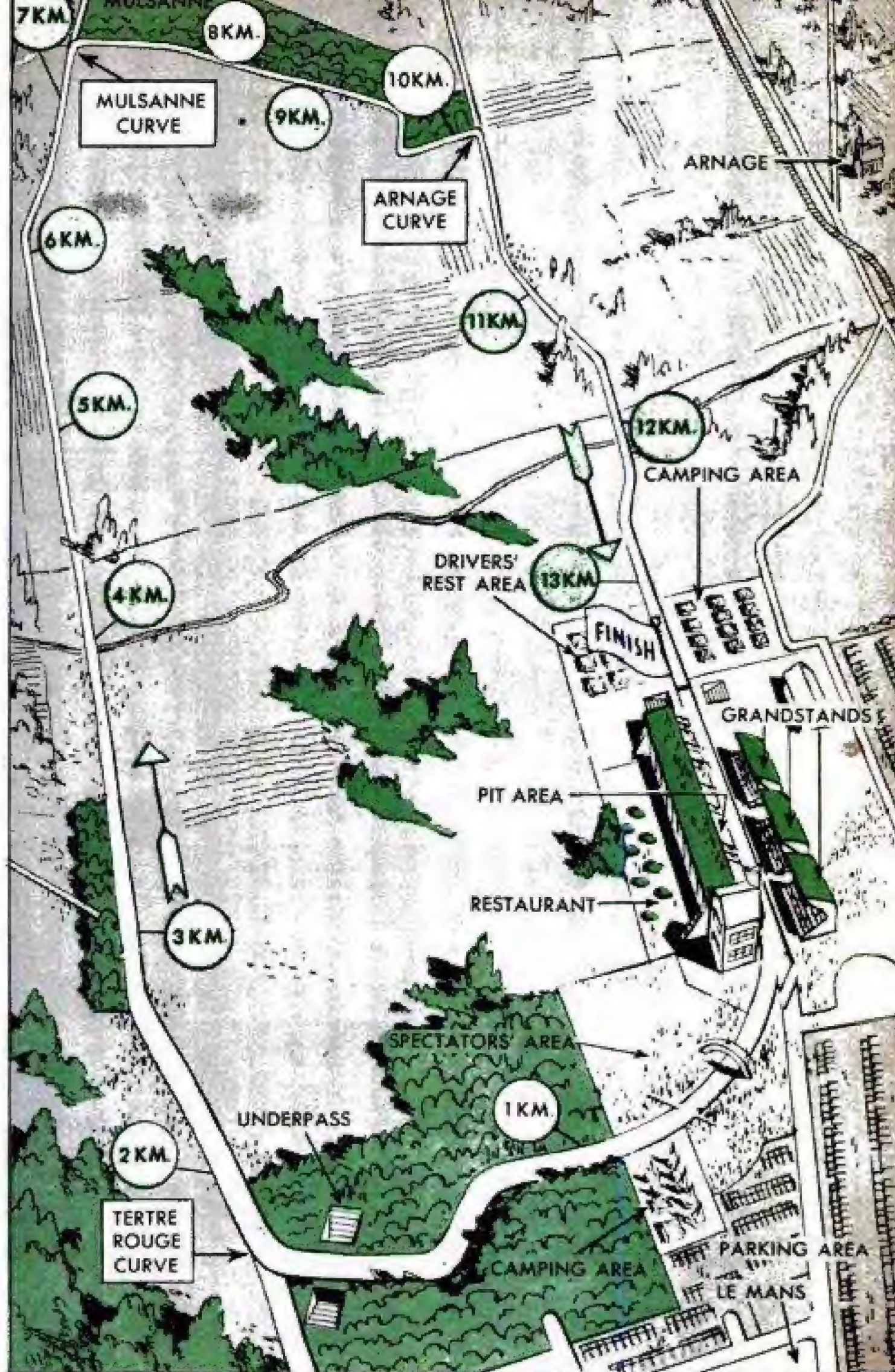
The Nash-Healey (driven by British drivers) placed third behind the two Mercedes-Benz cars. A Cunningham, driven by its builder and America's best-known sports-car manufacturer, Briggs Cunningham, finished fourth. Two other Cunningham starters were forced out with valve trouble.

This year, the Nash Motor Company will sponsor the two Nash-Healey entries, making them officially American. Because last year's team was British, the Nash-Healey had sort of a dual nationality. Cunningham, of course, will race under the American flag again this year.

So Uncle Sam has a good chance of winning in a race where the odds are long at best! Time—24 hours of it—alone will tell.

There are several factors that make Le Mans the outstanding race it is. First, obviously, are its 24 hours. A race in which the winning car travels 2320 miles in 24 hours is inevitably a tough one. Drivers are permitted substitutes for rest periods, but some try to make it the whole distance without relief. In last year's race, Pierre Levegh, driving without relief for almost 23 hours, was leading by about 30 miles with 90 minutes to go, when his car was forced out by mechanical trouble.

Briggs Cunningham, the American threat, drove 19 consecutive hours before taking time out for a rest. After four hours in the rest area,



Map of Le Mans course. Figures in circles are kilometers. Below, Briggs Cunningham and a Mercedes (rear) speed through an S-curve







**Cockpit of the Cunningham C4R with universal-jointed steering column and the wooden-grip aluminum wheel preferred for endurance races. Note the total absence of decoration and trim**

**Excellent brakes are essential in competition racing. Cunningham uses finned drums and an air scoop to cool them and prevent fading. Photograph made at the Watkins Glen race**

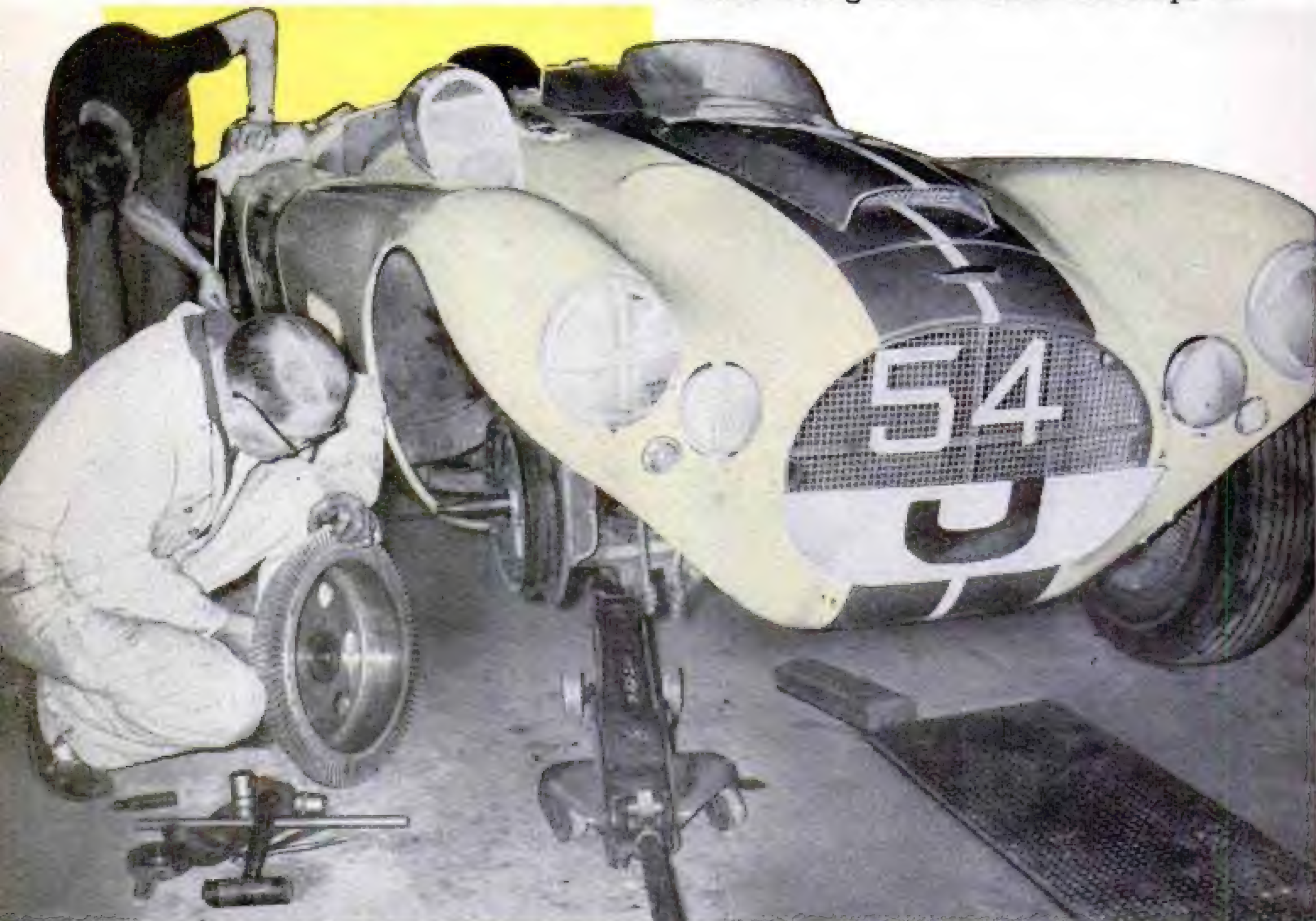
he took over from his relief driver, Bill Spear, and drove the final 60 minutes, finishing in fourth place.

Driving at high speed all night around a winding course is a supreme test of driving skill and physical endurance. But Le Mans is not merely a test for drivers. The cars have to stand up under tremendous abuse. Mechanical breakdowns are frequent as every part, from connecting rods to brakes, is stressed to its limit.

The course is no symmetrical oval with banked turns to ease cars around without strain. It is 8.38 miles of paved highway used for normal traffic on all except race days. There are seven right-angle turns, each straining brakes, steering and wheels to their utmost. There are two excellent straightaways for high-speed performance and one wide sweeping turn. The course is not level, but the slopes are mild.

Permanent grandstands accommodate only a fraction of the crowd. Thousands of fans line the course. Paid admissions in 1952 were estimated at 175,000, but there were probably more than 300,000 in attendance around the track. The spectators sleep in cars, tents, or on the grass. It is a full week end for them as well as for the drivers.

The winner is the car that covers the most miles during the 24 hours. Handicaps on







**Last year, Nash-Healey, right, was third in over-all classification at Le Mans. Cunningham, left, was fourth**

piston displacement give smaller cars a chance to win prizes in various categories. But the big honor is the winner of the over-all classification—the one Cunningham and Nash will be shooting for this June.

Unlike many American races, Le Mans begins from a standing start. The cars are backed into their pits diagonally and the drivers line up across the track opposite their cars. When the starting signal is given, each driver sprints across the track, jumps into his car, fastens his safety belt and starts the engine—all under the supervision of officials. Then each driver pours on the petrol as he makes a desperate bid

to get away first and avoid the jam of speeding cars in the first lap.

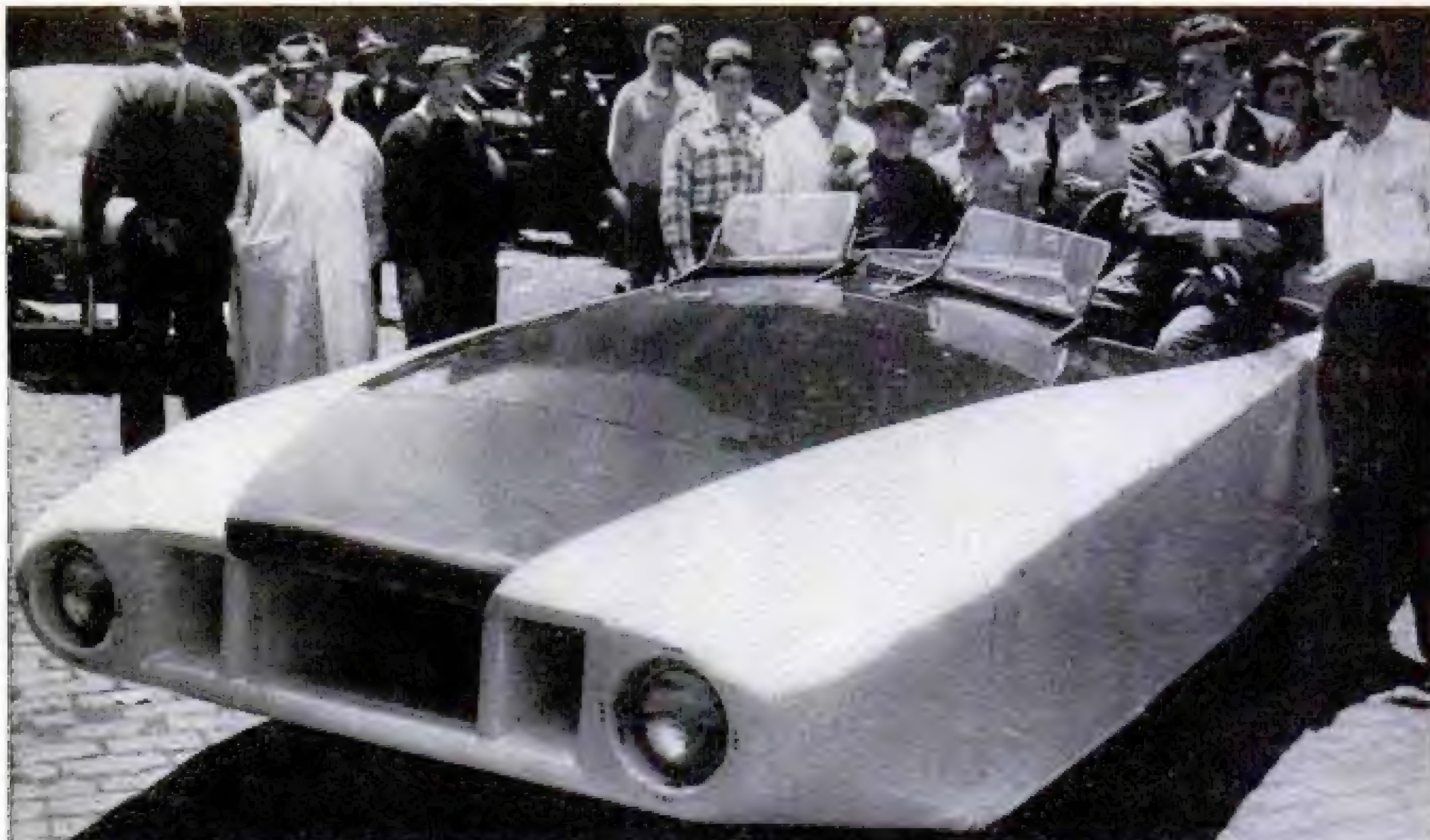
Gasoline, water and oil ports are sealed before the race starts and can be opened only under official supervision. Only official 80-octane Le Mans gasoline can be used. No water can be added during the race. Each car must travel a minimum of 234 miles before its first refueling. No mechanical work can be done on the cars except by the driver or riding mechanic.

One Cunningham entry had trouble last year because of this no-help rule. Duane Carter slid off a corner into a protective sand pile and spent 90 minutes digging his

**Cunningham's Le Mans coupe was powered by a Chrysler V8 engine, made accessible by a front-hinged hood**







First car Cunningham designed for Le Mans was called "The Monster" by French race fans because of its size

car out. Another driver pushed his disabled car for two miles to return to the pits.

Of the first 10 cars to finish in 1952, eight were six-cylinder jobs. Two of them were V6s. The Chrysler-powered Cunningham that finished fourth was a V8. The only other non-six-cylinder car was the fifth-place winner, the Ferrari V12.

The majority of cars finishing had engines developed from standard production models (like the Chrysler and Nash en-

gines). The special racing engines failed to stand up under the terrific punishment.

The Nash-Healey was powered by the Nash Ambassador Dual Jetfire six-cylinder engine with a standard aluminum 8:1 head, dual carburetion and a slightly modified camshaft. The 1953 Nash entries will use the same souped-up engine, now called the Le Mans engine by the company.

Briggs Cunningham is putting his 1953

(Continued to page 248)

Along the straightaways at Le Mans, the Nash-Healey (10) hit 140 miles per hour. Its race average: 91.5







Panel light shows which train has entered main line

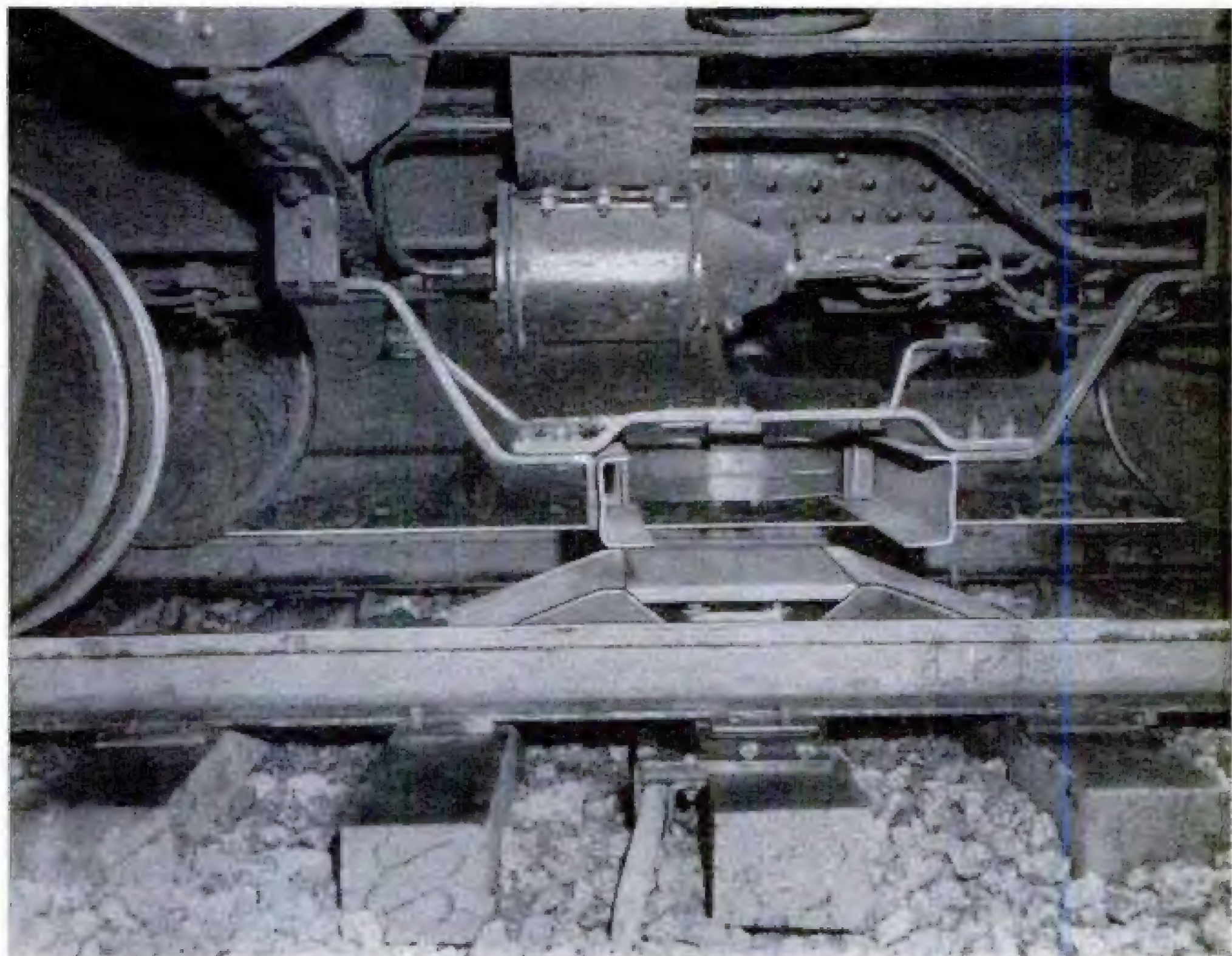
## Robot Records Trains

TRAINS 22 MILES AWAY are automatically identified and traced by an electronic system installed on the Erie Railroad. Beneath the caboose of each train is an identifying coil, which returns radio waves in a certain pattern to an energizing coil between the tracks. The signal then is transmitted 22 miles to an electronic panel before the dispatcher.



Arrow shows energized coil between tracks which identifies train by its return-wave pattern, transmits information to dispatcher

Hung beneath each caboose is a coil wound in a particular pattern. Waves from track coil are returned according to this pattern





# SWEDEN WORKS UNDERGROUND



Visitors enter atomicproof factory through this gate, descend by stairs and Escalators to working area

**F**AR BENEATH the Swedish town of Linköping, an underground aircraft factory hums with vital defense work. Trucks loaded with raw materials and parts descend to the subterranean plant through a long sloping tunnel. From the tunnel emerge gleaming airplanes—small planes ready to fly and large planes complete except for wings.

Just 30 minutes by jet bomber from Soviet territory, the buried plant is ready for the worst that modern war may bring. Housed in mammoth manmade caves blasted from solid rock, it is part of the new pattern for Swedish industry.

Since Hiroshima, Swedish builders have burrowed into the thick granite and gneiss mantel which covers most of the country to construct plants, hospitals, hangars, military headquarters, munitions and fuel dumps. Along the coast, Swedish submarines will eventually weigh anchor in huge grottos that will be torn from the sides of rocky cliffs.

Across the country, civilian A-bomb shelters are being tunneled from the rock. Impervious to concussion and shock waves, they are protected from falling material by arched roofs of reinforced concrete, supplied with their own water and power, and equipped with air-conditioning systems to





filter out harmful ingredients. A luxury hotel being built in Vasteras, 525 miles due west of Leningrad, will be housed completely in rock, and even boasts a large underground gymnasium.

If an atomic bomb falls near the Linkoping aircraft plant, a typical subterranean industrial installation, the blast wave would be moderated by baffles and pockets inside the tunnel. Filters in the plant's air-conditioning system can stop flying radioactive particles and even block poison gases. The factory's self-contained water system would be unimpaired and an emergency power plant would switch into operation.

The manufacturing plant itself is housed in a concrete building resting on the bed rock of the main tunnel. A row of columns down the middle of the ground floor supports the second story, aided by steel columns along the sides and pillars of concrete block firmly embedded in the tunnel rock. Walls are lightly reinforced-concrete slabs. A reinforced-concrete roof guards against rocks jarred loose by concussion. ★ ★ ★



Parts are stored in air-conditioned area, heavy equipment and materials in large pockets cut from solid rock. Warehouses, an inspection section and testing laboratory, offices and an employee's restaurant are all included in the underground plant



Subterranean factory can maintain production during worst air raids. Well-lighted and comfortable, it has low labor turnover







U. S. Forest Service photo

Too many trees, too little lumber—that was the lodgepole-pine story until mechanization came to the forests

# LUMBER FROM “TOOTHPICKS”

**J**UST LITTLE BITS o' trees they're cuttin' down here! It ain't right, is it?" questioned Carl Hjarne when he saw the men of Biles-Coleman Lumber Company logging lodgepole-pine trees so small he could almost circle them with one of his big hands. Logger Carl was visiting in the

Okanagan Mountains of eastern Washington. He lives in the lowlands near Lilliwaup on the west side of the state where it rains at least half the year. Douglas-fir trees, several feet in diameter, thrive there because of plentiful moisture.

But the eastern Washington company is

By  
**Robert H.  
Forbes**

Loader hoists lodgepole logs aboard truck in middle of forest. These logs will be used to make paper

U. S. Forest Service photo





logging tiny lodgepole pines, few of which are more than a foot thick at the base.

"These pines are stagnated, Carl," pointed out Emmitt Aston, forester of the lumber company. "Hundreds of them popped up after a forest fire. They're too thick. They aren't growing very big, but they aren't dying either. There's just too much competition for sunlight and water."

Emmitt bent over the end of a lodgepole-pine log 11 inches in diameter and started to count rings in the wood. "One hundred and thirty years to grow to this size!" he said finally. "Over in your section—where forests never get stagnated—almost any tree that age would be at least five times as large. By cutting down the little pines, we're giving a new forest a chance to grow under foresters' management."

The little pines not so long ago were called "weed" trees. They were of almost no importance other than as scenery in vacation spots like Yellowstone Park. In the old days, Paul Bunyan used lodgepole pines only for toothpicks, but now the Biles-Coleman company is manufacturing lumber from them.

Harvey Jolley, a modern Paul Bunyan, shoves the small pine logs 7½ feet long into a horizontal bandsaw at the sawmill in Omak, Wash. He splits them in half. Half logs then whiz on a merry-go-round of rollers and endless chains to Boyd Ogden, who slips them in the other side of the same bandsaw and slices a slat one inch thick from the bottom of each.

Partly sawed logs and one-inch slats next go on another ride. John Calvin snatches out slats and sends them on a belt for fur-



Logs are milled to lock together, with a big hole drilled through each to aid drying and insulation

ther processing. Whittled-down logs keep on traveling 'round and 'round as long as the bandsaw can cut a slat two inches wide.

The horizontal bandsaw is a newcomer to American sawmilling, borrowed from Europe where primary cuts of logs by horizontal bandsaws have been made for years. The saw is essential in cutting lumber from "toothpick size" trees.

Slats zip out of the lodgepole mill at the rate of 175 to 185 linear feet per minute, considerably faster than boards are turned out by other sawmills of its size.

Lodgepole-pine slats, two inches to twelve inches wide, are not in the final form of lumber until they have gone on another merry-go-round ride in the plant. As many as a dozen slats are fastened together by their edges to make a piece of lumber three

Factory-made dormitory is built from the straight logs tongued and grooved and set vertically on a foundation

Haynes Studios Inc. photo







Telephone poles made from the tall, straight pines are stacked like jackstraws for shipment from forests

feet wide. Slats on the second merry-go-round are joined by a machine which puts a dovetail joint in slat edges, then glues the slats together.

The whole edge-joining job is done automatically by the machine at the rate of 60 feet of joint per minute.

Little lodgepole pines have risen in lumber production from a bare 25,000,000 board feet per year in the 1930s to over 100,000,000 board feet annually now. Hundreds of other wood products, which cannot be measured in board feet, are also built from the trees. In 1935, about 60,000 telephone and telegraph poles were made of lodgepole pine.

Last year the total was about 250,000 poles.

Lumber products from lodgepole pines and other small trees are also rolling out of the high-speed Tyson Creek Sawmill near Santa, Idaho. The specialty here is two-by-four timbers eight feet long, to be used for studs in building construction.

Logs enter the mill in a near-continuous flow and are stacked for processing. Each log tumbles into a trough and is then shoved into four circular headsaws. These cut three timbers, either two or four inches thick, that are easily converted into lumber of the desired dimension.

Recent discoveries of wood chemistry

Unique machine cuts dovetail joints in edges of slats, then glues and joins them to make a panel of wood





also have boosted the use of lodgepole-pine trees for pulp and paper. "Pulp of lodgepole pine mixed with Douglas-fir pulp makes superior kraft paper—brown wrapping paper—for many uses," states Harold Olson of American Forest Products Industries, Inc.

Tens of thousands of new-timber acres in the West, many of them stagnated, have thus been discovered without much searching. Lodgepole pines are found from near the Pacific Ocean to the Black Hills of South Dakota, from the Yukon River to the mountains of Mexico.

"Until recent years, lodgepole pines in these parts served only as excellent fuel for the toughest forest fires we ever saw," says I. V. Anderson, chief of the Forest Utilization Service in Missoula, Mont.

In fact, the trees are called forest-fire trees. They have the peculiar ability of seeding land soon after the embers of a fire have died—before other trees get a chance to do so. It was even believed for years that the cones would not open and scatter their seeds unless they had been roasted by flames.

Once cones have loosed seeds, the trees are so aggressive that as many as several thousand wispy little seedling pines may strive for life on an acre of land.

Unusual products add to the demand for lodgepole-pine timber. A radically different kind of log cabin is being produced from the trees, with well-peeled logs set vertically on a foundation. It is manufactured at a plant in Thompson Falls, Mont.

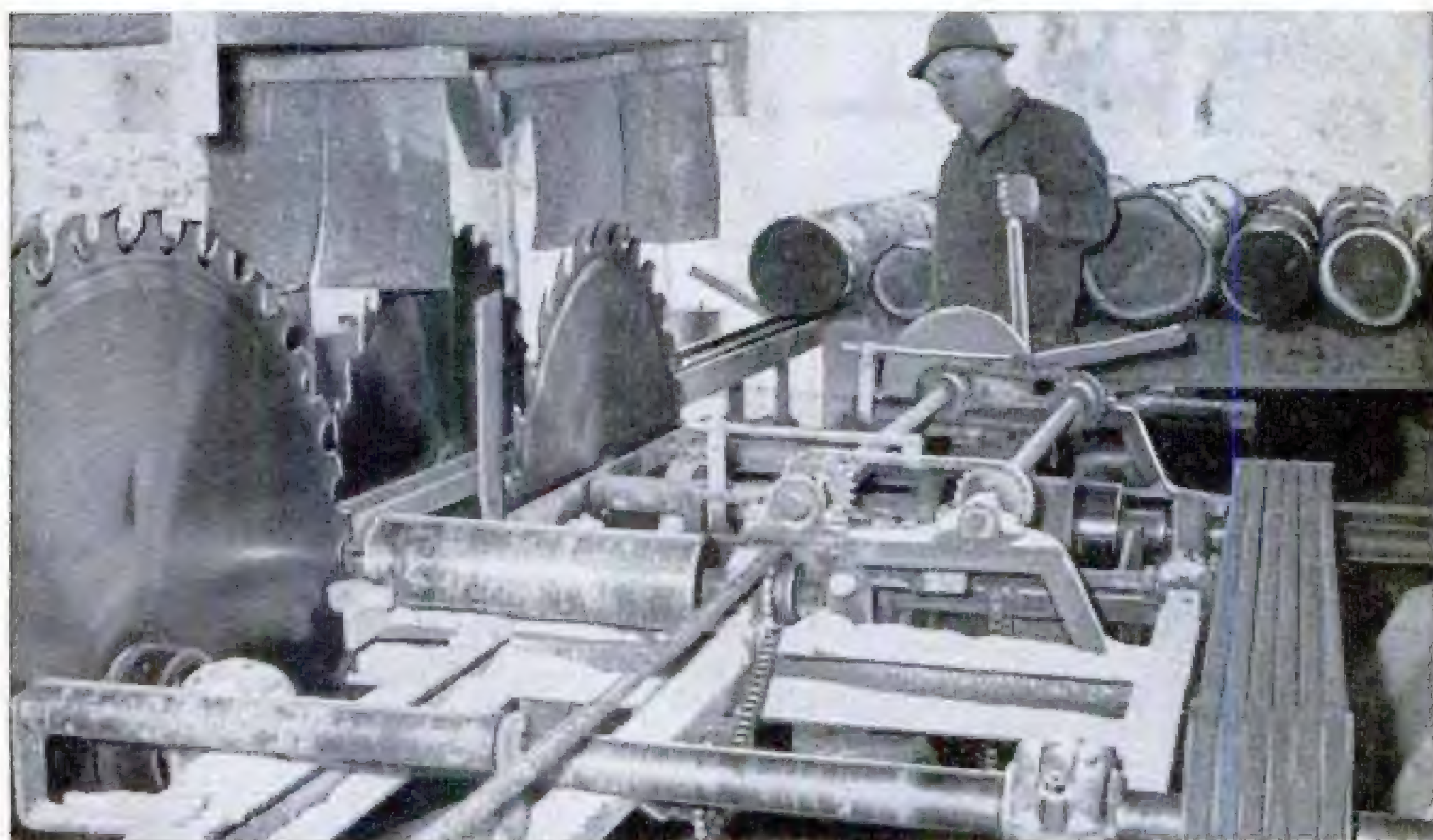
The pines have always been favorites for log cabins. They grow straight and tall, often only  $\frac{1}{4}$  inch smaller at one end of a

(Continued to page 246)



Nine narrow slats of lodgepole pine were joined by machine to make this sheet of lumber 27 inches wide

Small logs move through four saw blades which cut them to the correct dimensions for two-by-four studs





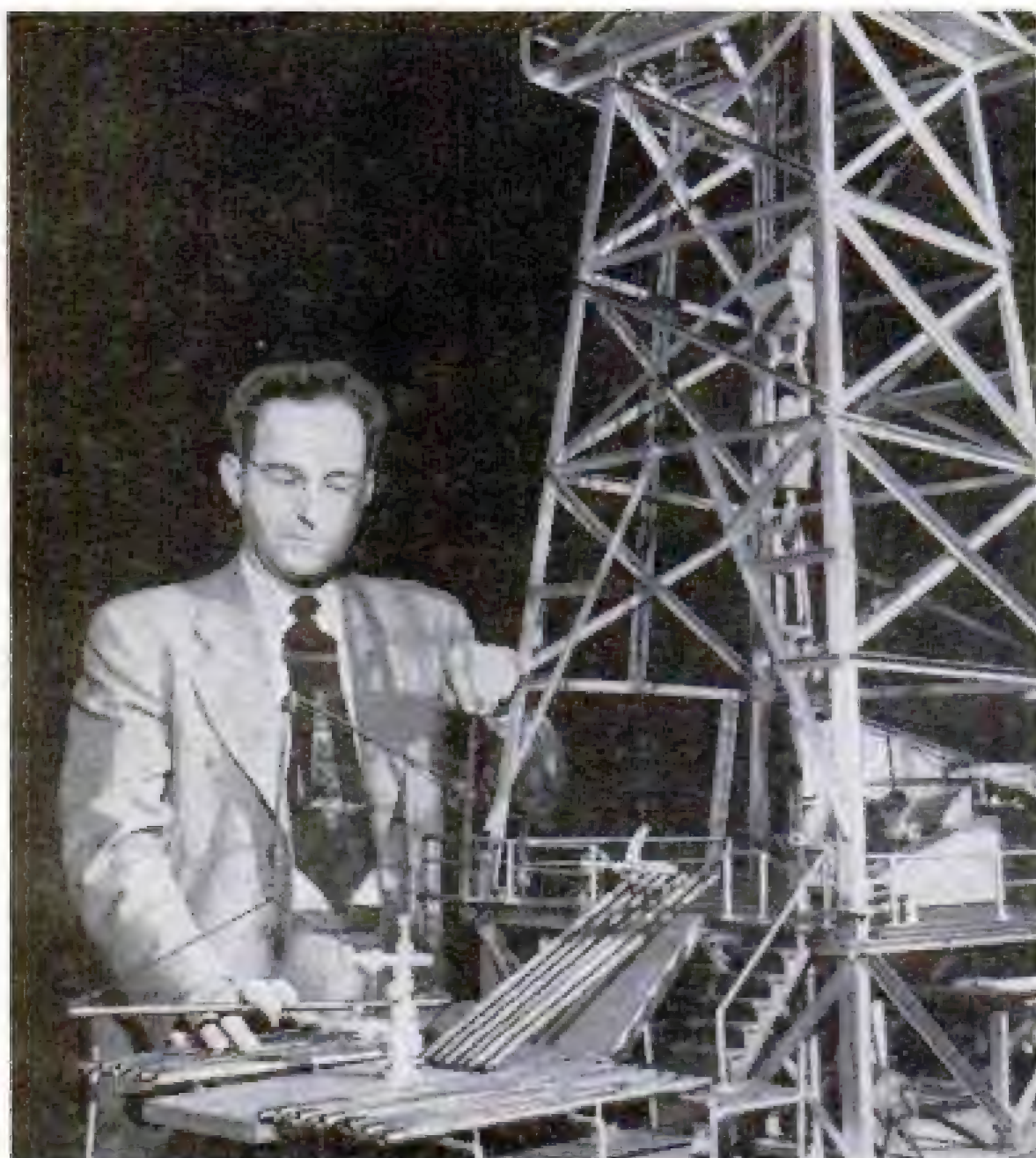


## Wind-Tunnel Model Aids Air-Pollution Studies

Air pollution caused by a factory can be determined before the plant is built. One New York electric-generating company wanted to add to its facilities, but feared that the addition would increase air pollution. The problem was turned over to consulting engineers who enlisted the aid of New York University's College of Engineering and its low-speed wind tunnels. By building models of the new facilities along with the old, the surrounding buildings and

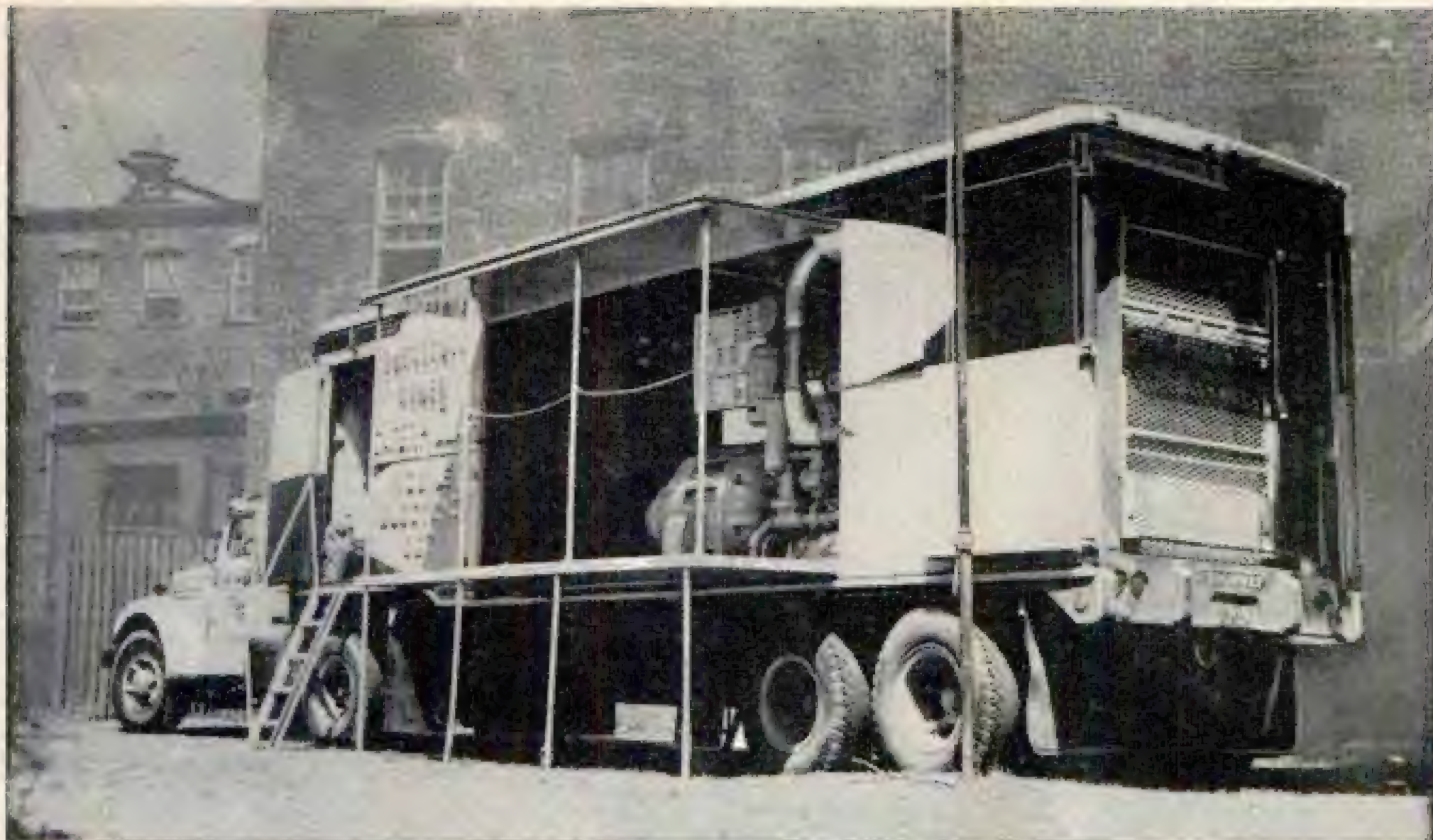
terrain inside the tunnel, it was possible to study the behavior of smoke and gases from the smokestacks under a variety of wind conditions. By varying the design, the engineers devised a structure that would not add to air pollution. Furthermore, by suggesting changes in existing stacks air pollution was somewhat reduced. In the study, smoke emanating from the models flows past a grid which can be photographed for accurate measurement.

## Model Oil Rig Demonstrates Drilling Techniques for Students



Students at Southwest Louisiana Vocational and Technical School learn about oil drilling from a scale model which duplicates the real article in every respect. And though it hasn't struck "pay sand" as yet, in one demonstration it sank a 52-foot shaft. The rig is mounted on a barge which floats in a tank during demonstrations, thus duplicating the typical Louisiana installation of a well in offshore and marshy areas. A "heavy duty" boom like the ones used to transfer pipe from supply barges handles the miniature pipes. Directly below the pipe rack are fresh-water tanks. These hold a water supply for cooking, drinking and other purposes. The substructure conceals mud lines, drill-line spools and other pieces of equipment. With working parts powered by a  $\frac{1}{10}$ -horsepower electric motor and complete with a 6½-foot derrick, it was constructed by students with the help of manufacturers.





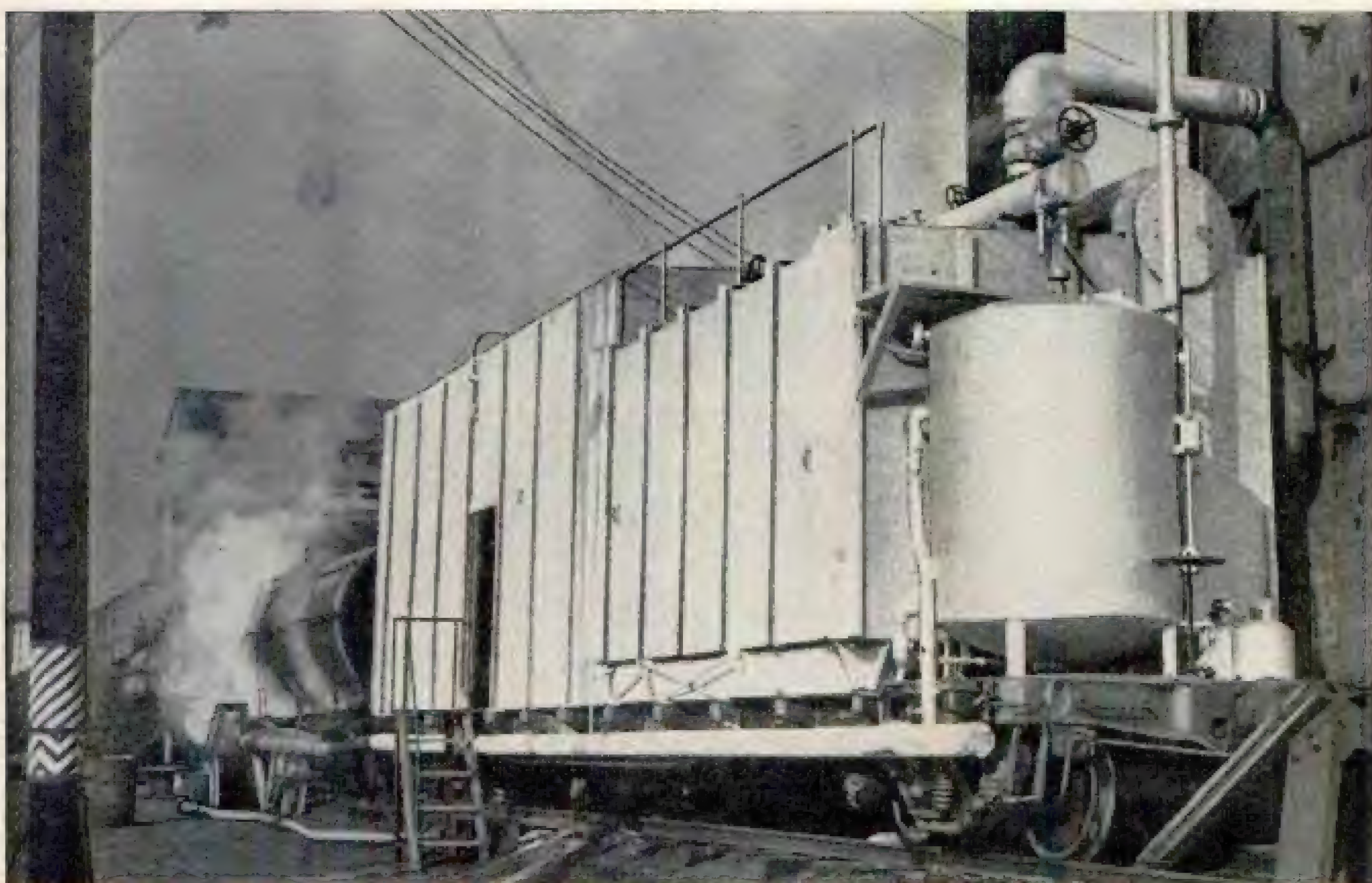
Truck unit, available to communities that suffer from critical electricity shortages, has proved its worth

## Mobile Power Plants Serve Emergency Needs

TWO MOBILE POWER units, one set in a semitruck-trailer and the other mounted on a railroad flatcar, are equipped to go almost any place in the United States to serve emergency needs. The "semi" houses a diesel-electric generator, which is used to boost the current of power-short commu-

nities. After solving a critical power shortage in South River, N. J., last year, the 28-ton rig moved on to Sioux Falls, S. D. The flatcar unit develops steam to operate steam pumps, clean tanks and supply heat. Oil is burned to produce up to 20,000 pounds of steam per hour.

Fifty-foot flatcar steam plant was designed to meet needs of expanding industrial operations in Pennsylvania





# TOOLS FOR YOUR Lawn and Garden

**1. POWER SPRAYER** is easily wheeled about the lawn and develops up to 200 pounds of pressure. At low pressures it sprays lawns and spreads weed-killing mixtures; at high pressures it fogs insect-control chemicals into the trees

Lansing



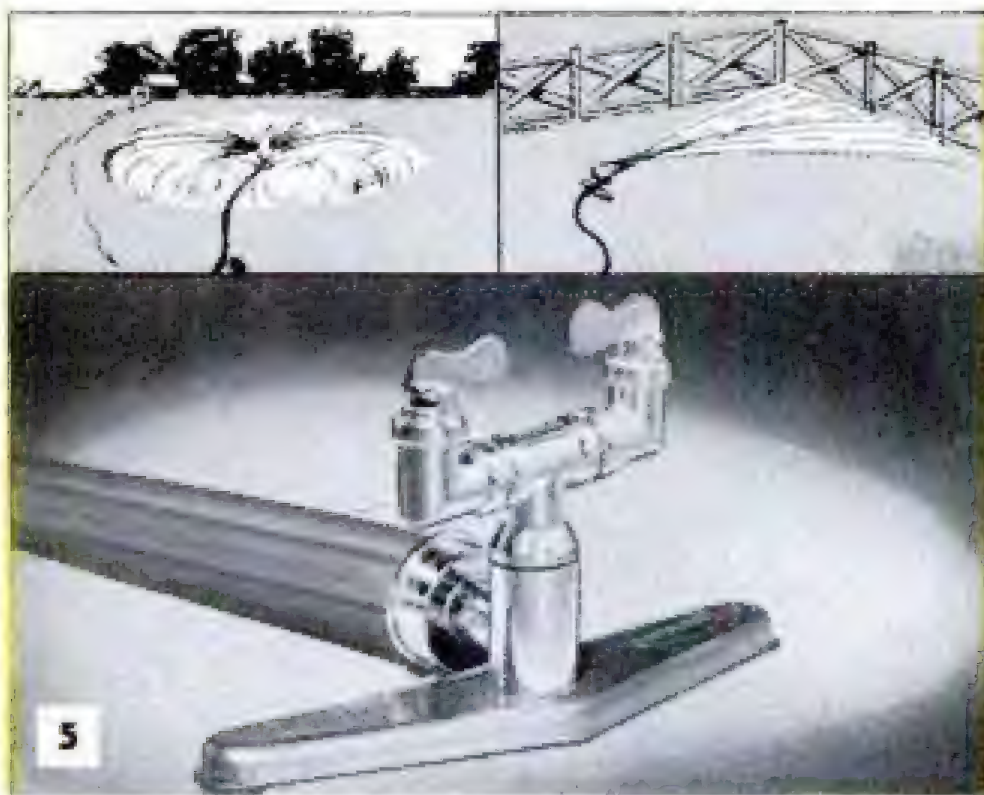
**2. WATER TENDER**, connected to hose, meters out water for a preselected time, then automatically shuts itself off. Dial permits time variation from five minutes to four hours. Just set it and forget it

**3. SIT-DOWN MOWER** has a sulky attachment that lets the homeowner mow in comfort. A skid at the front of the machine guides the mower so it glides over uneven spots without biting or scalping the turf

**4. GARDEN CADDY** helps tote tools around the yard. Rubber-tired cart has a steel compartment to hold long-handle tools. Elastic band holds hand tools and gloves, and clamp secures pail or box between wheels







**5. TWO-NOZZLE SPRINKLER** can be adjusted to spray in circular, semicircular or rectangular patterns. The gardener can also vary the elevation and force of the water to reach across driveways or deep under trees



**6. FERTILIZER SPREADER** sifts manure or peat moss as it moves. Fertilizer is loaded into the hopper. Speed determines coverage: If operator walks slowly, deposit is light; fast walk leaves heavy blanket

**7. POWER EDGER**, driven by gasoline motor, trims grass along sidewalks, flower beds and walls. For edging sidewalks, blade is in vertical position. With blade horizontal, cutter trims within  $\frac{1}{4}$  inch of wall



**8. ALUMINUM TRELLIS** won't rust, never needs painting or repairing. Six legs simply are pushed into the ground to support the trellis and rosebush or vine. Trellis measures six feet tall, four feet wide

**9. POWERFUL MOWER** of the self-propelled rotary type is driven by a six-horsepower engine. It cuts tall grass, weeds or even light brush  $1\frac{1}{2}$  feet high. Speed of blade is constant, regardless of mower speed

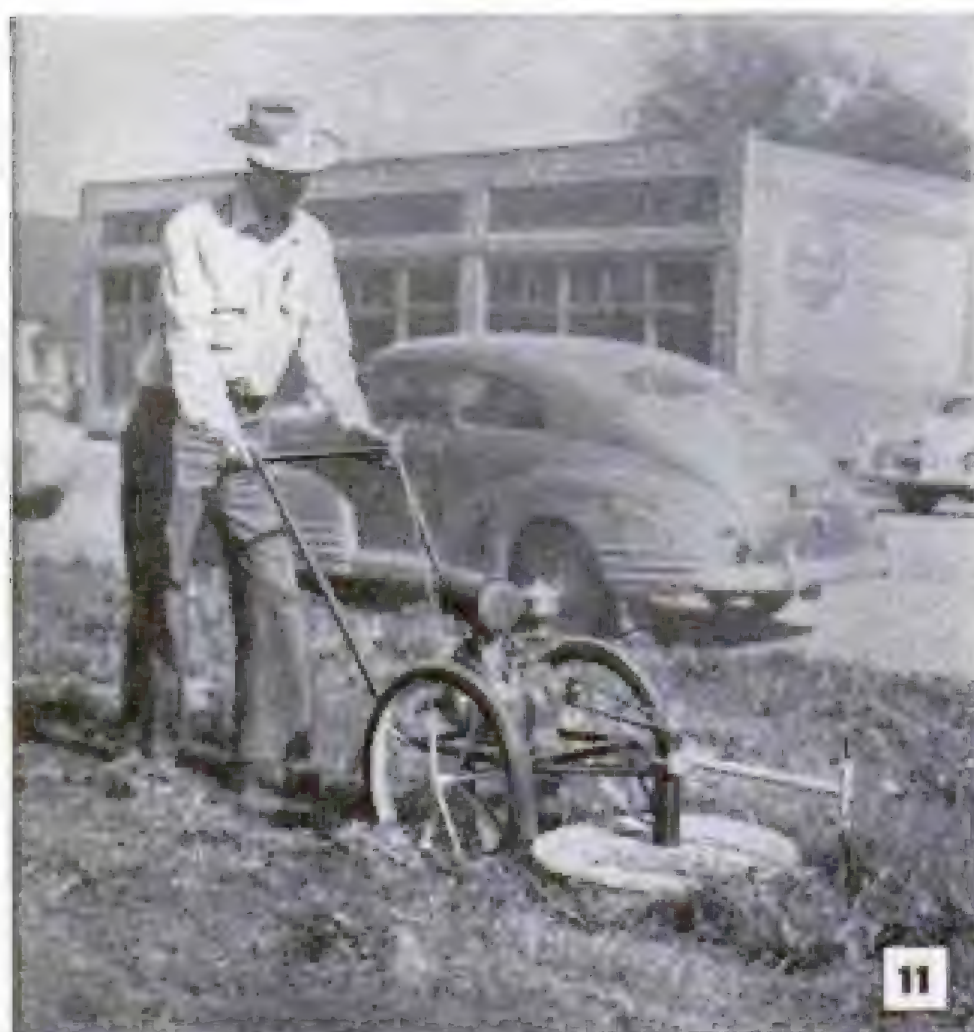




# TOOLS FOR YOUR Lawn and Garden



**10. GARDEN TRACTOR** is light enough for a housewife to maneuver. A 2½-horsepower engine provides the power. It cultivates soil to the desired depth in a swath 12 inches wide. Speed can be adjusted



**11. BIG-WHEEL MOWER** is easy to control on any kind of terrain. Its rotary blade cuts a 21-inch swath even through tough weeds. Front caster wheel keeps mowing depth constant from one to five inches

**12. MULCHING MOWER** blows cut grass across uncut portion of the lawn. Next time around, mower cuts same blades again to form a mulch for lawn. Mulching feature also is available in an electric mower

**13. CULTIVATOR** weighs 85 pounds, delivers all its power directly to its rotary tines. It crumbles and stirs soils to a depth of 10 inches. Same machine with attachments becomes a complete garden tractor







14

**14. FOG GENERATOR** can be wheeled about the garden to spread insecticides and other chemical solutions in a fine mist. With plants covered, fog spreads over surface of each leaf in effective film



15

**15. ELECTRIC MOWER** cuts grass or weeds up to two feet high. At the end of a swath, operator flips handle on over mower and starts back—mower cuts in either direction and cord stays outside path

**16. TRIPLE-TUBE SPRINKLER** is actually perforated three-channel hose that lays flat on ground, can be curved around flower beds and walks. Each channel sprays in a different direction for full coverage

**17. YARD POWER** is provided in a two-horsepower unit which has five attachments: Rotary mower (shown here), reel-type mower, snow plow, weed cutter and cultivator. Attachments easily changed

**18. REEL ATTACHMENT** now available for rotary snow plow makes machine useful the year 'round. Mower is 20 inches wide. Also available is 28-inch sickle-bar attachment to convert unit into scythe



16



18

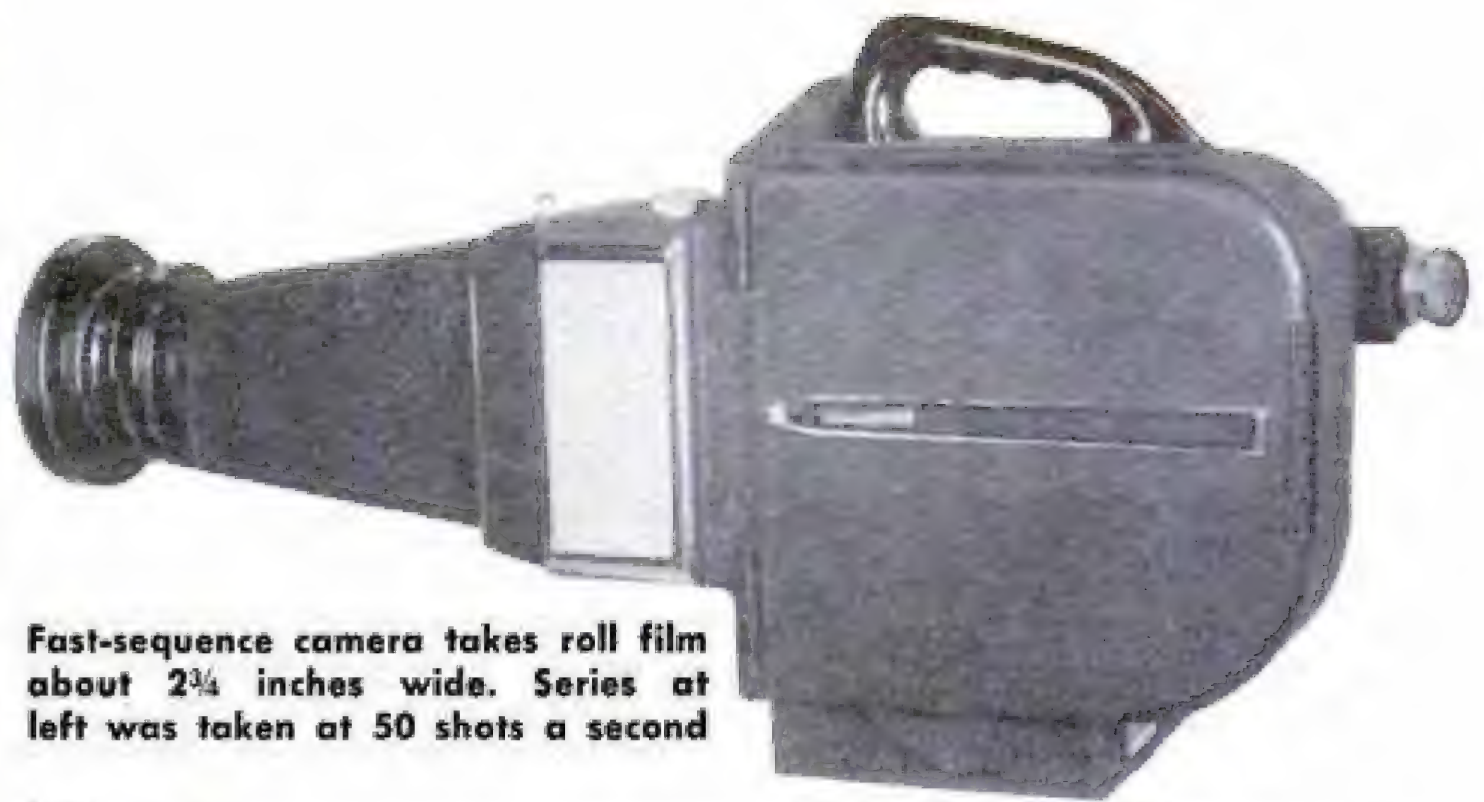


17





Fast-sequence camera takes roll film about 2 $\frac{3}{4}$  inches wide. Series at left was taken at 50 shots a second



## Rapid-Sequence Camera Takes Big Pictures

Providing the advantages of both movie and still photography, a 70-millimeter high-speed camera takes as many as 50 large negatives per second. Designed principally for research work, the camera will expose 25 five-inch frames or twice as many 2 $\frac{1}{2}$ -inch frames per second. It is equipped with reflex focusing, variable frame-speed control, electric braking and provisions for changing frame size in less than two minutes. Camera weight is 32 pounds. A double rotating disk-type shutter makes exposures of  $\frac{1}{1200}$  second. Operated with a 110-volt power supply, the camera takes standard 70-millimeter film in 100-foot daylight-loading rolls. No lens is supplied. Lenses with focal lengths from 7 to 40 inches can be used. The camera is especially suited for recording high-altitude-missile flights.

## Dual Air and Hydraulic Brake for 97-Ton Amphibian

Separate air and hydraulic systems can be applied independently or together to brake the Army's new amphibious Barc, a 97-ton big brother of the World War II DUKW. The air system is used as a service brake, with the hydraulic system always available for emergencies.

## Ditcher-Terracer Blade on Farm Tractors Adjusts to Many Positions



Ditches up to five feet deep can be dug with a new earthmoving blade for farm tractors. The six-foot blade, raised or lowered by the tractor's hydraulic system, swings completely around and can be locked in any one of 14 positions to throw the dirt either right or left. It also can be tilted to any degree by loosening a wing nut, disengaging the toothed locking mechanism, tilting the blade as desired and tightening the nut. In digging a ditch, the blade cuts up to 16 inches deep in its first pass. The resulting V-bottom ditch is suitable for drainage tile, with the topsoil saved on one side of the cut and the subsoil on the other. In terracing, the blade can be swung completely around and used for back-filling. The cutting edge can be reversed if desired after a period of use.





Top telescopes to standing height and the sides swing out to accommodate bunks. Rear awning supplies shade

## Telescoping Trailer Cabin

HUNTING AND FISHING trips make wonderful vacations, Carl Pister believes—if you don't have to sleep in a tent. His solution is a telescoping cabin that fits onto a pickup truck or trailer chassis. At the camp site, the top of the 600-pound unit raises two feet to standing height and hinged sides, into which bunks slide, swing out for a width of nine feet. High screened windows provide light and air. In a front niche is a portable range and kitchen table. Built at a cost of \$600, the cabin has a frame of angle iron and square steel. It is covered with waterproof plywood.

In expanded position, cabin is kitchen and bedroom for two. Below, ready for travel, trailer is compact and roadable





# COLLEGE FOR PLUMBERS



Model of partially finished house is surveyed by student who will then map plumbing



Training in sheet-metal work is needed to install heating and air-conditioning systems

Practical instruction includes basic tasks like threading and fitting strap to a pipe hanger





**I**T MAY BE some time before you'll need a bachelor's degree to fix kitchen faucets, but in Los Angeles they've set up a four-year college curriculum for would-be plumbers.

Actually, plumbing can be a pretty complicated business, especially when you're designing the water system for a large factory or office building, with its miles of pipe lines. A person familiar with all phases of plumbing can save thousands of dollars and eliminate costly changes on a large job. Recognizing this, a group of master plumbers in the Los Angeles area worked with the faculty of Los Angeles City College in creating a course in plumbing engineering to give students an over-all, detailed knowledge of the field.

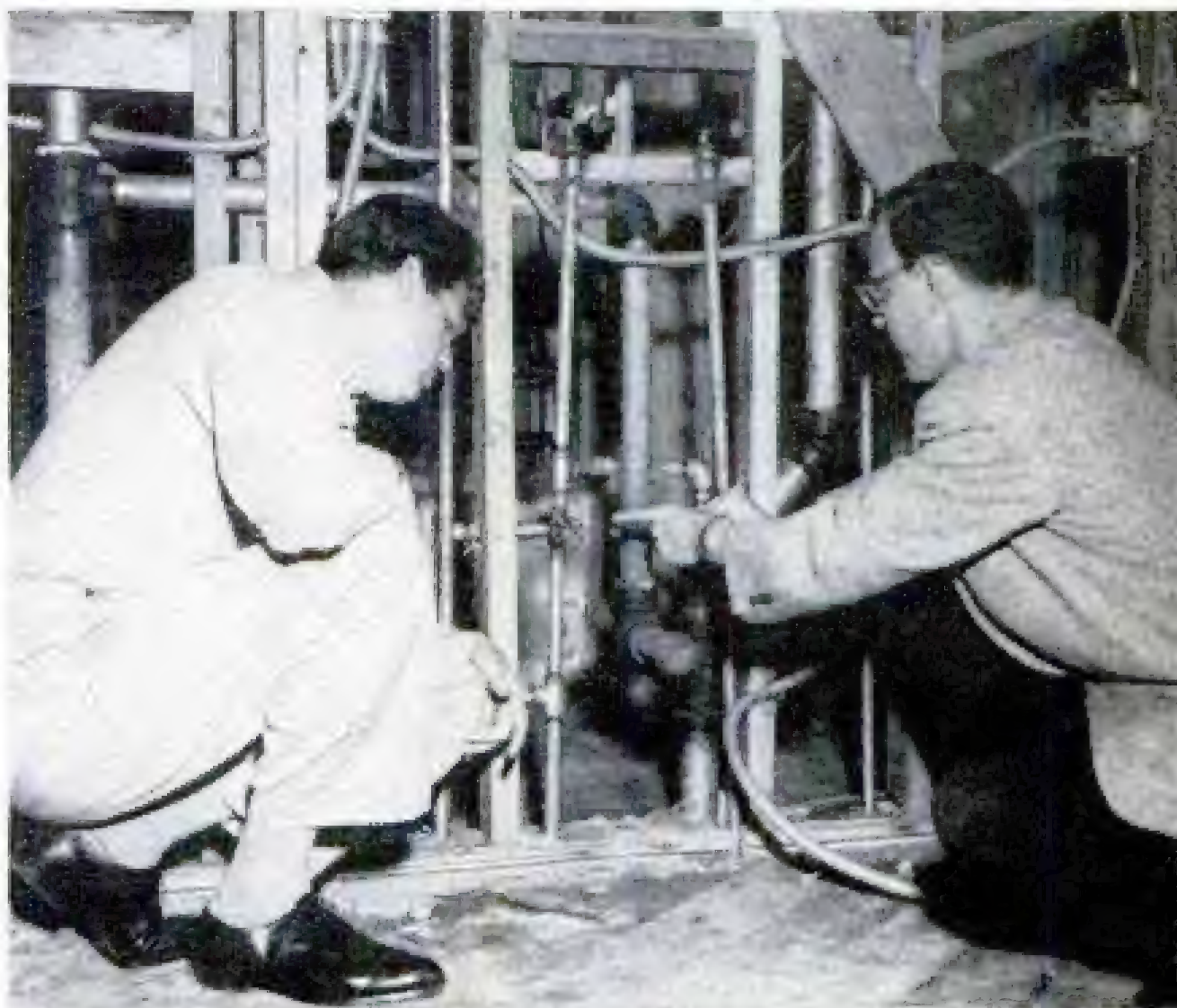
Subjects in the two-year basic course include mathematics, physics, chemistry, surveying, plumbing problems, engineering drawing and general courses like English, history and economics. Following this is an intensive two-year program at Los Angeles State College, with fluid mechanics, sanitation bacteriology, law for plumbers, hydraulics, plumbing-construction estimating, heating, ventilation, refrigeration, air conditioning, fire-sprinkler systems, thermodynamics and allied subjects. During summer vacations each student works as a plumber's apprentice for academic credit.

Upon graduation, he will be equipped with practical and academic knowledge to beat the many complex, as yet unsolved, problems which await. ★ ★ ★

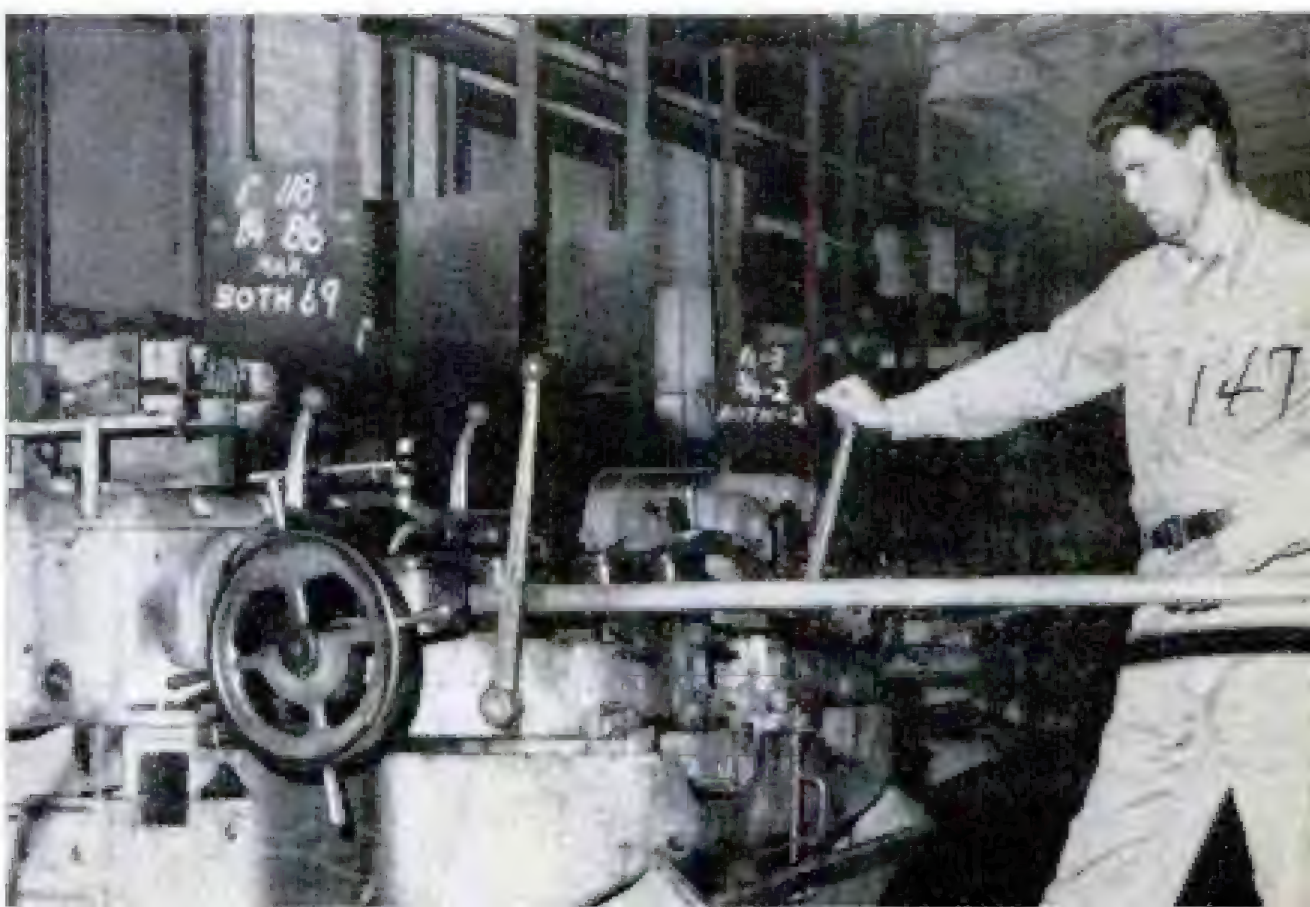
**Student operates a pipe cutter, standard equipment in the average plumbing shop**



**Trainee dons goggles and asbestos gloves to learn use of a cutting torch. Students work as plumbers' helpers during summer**



**City plumbing inspector tells what he looks for when checking a system. All plumbing must pass city or county inspection. Below, trainee operates large automatic pipe threader. Many contractors cut and thread pipe before taking it out to job**







Whirlmobile, a collapsible indoor merry-go-round, was one of four inventions shown on the first program

## ***Inventors Hit Television Jackpot***

APPARENTLY, many good inventions end up in attics instead of the market place because only three percent of all patents are used. However, "The Big Idea," a Du Mont television program that serves as a showcase for independent inventors with bright ideas, is knocking these discouraging statistics for a loop. In the first seven weeks the program was on the air, 28 inventions were shown. Of these, 16—or 57 percent—have been purchased or are in negotiation with investors and manufacturers. Ex-engineer Donn Bennett, the program's host, brings four inventors to the nation's video screens

each week and invites them to exhibit their "brain children." The first programs included the Whirlmobile, a portable, collapsible merry-go-round that can be set up in the living room on rainy days; a coin chute which separates and stacks all coins from a penny to a half dollar; a hydraulic automobile piston said to eliminate the need for overhauling; and a buoy which would float free of sinking ships and planes, flashing a light for five miles to guide rescuers to survivors. Other devices included a hot-plate lunch box, a design-printing paint roller and a portable washing and drying machine.

From left to right are coin separator, long-wearing automobile piston and a blinker buoy featured on TV





*the*

POPULAR  
MECHANICS

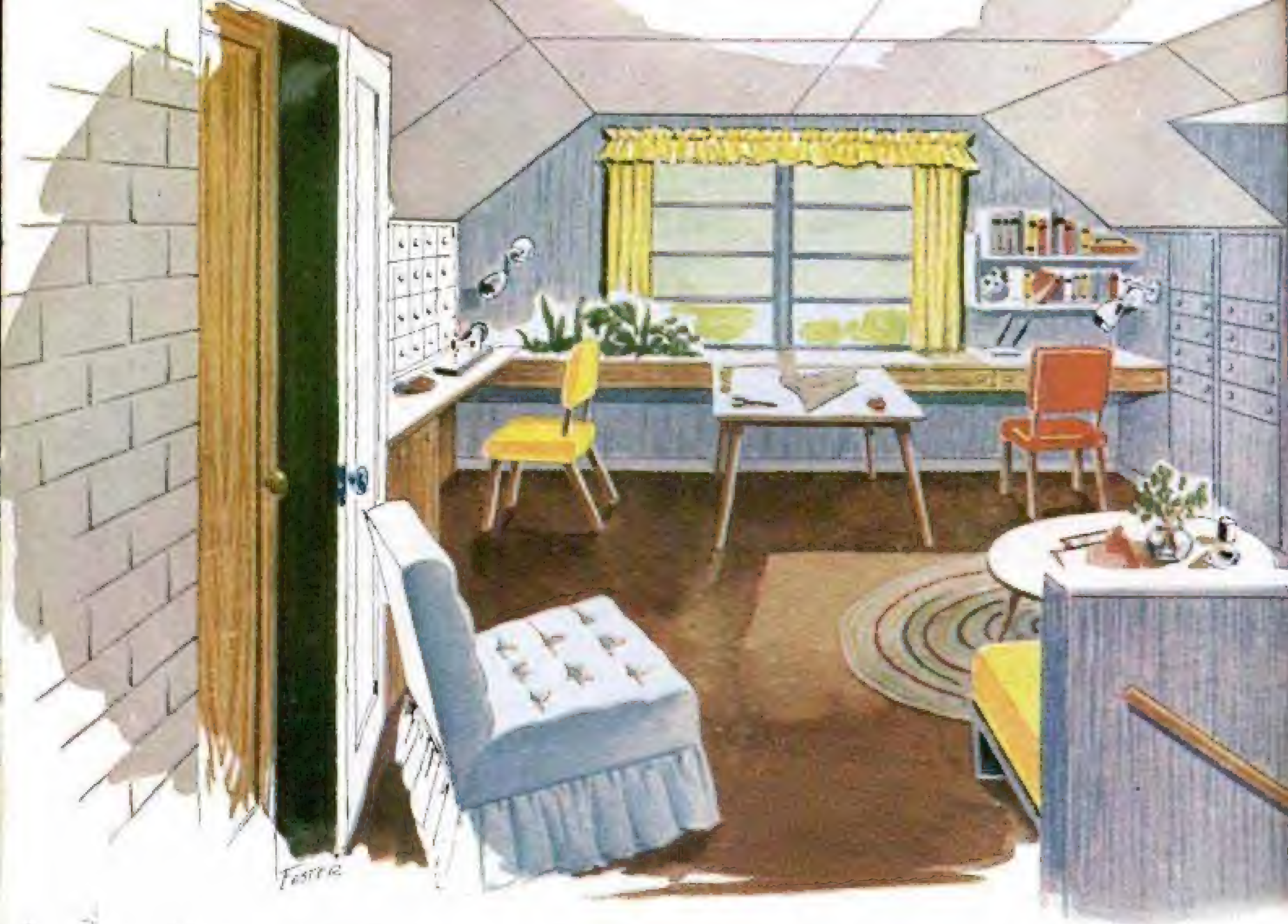
# CRAFTSMAN



**SEE STORY  
NEXT PAGE**







## PANEL YOUR HOME WITH

**A**RE YOU INTERESTED in refinishing a room, paneling the attic or basement or completing the interior of a new home? If so, plywood in one of its many textures and finishes can do an excellent job and, best of all, it is easy for the amateur to apply.

Today, plywood is being used extensively on walls and ceilings with striking results—another of the countless applications to which this versatile building material naturally lends itself.

As there is a wide variety of types and price ranges from which to choose, selecting the plywood best suited for your particular purpose becomes but a matter of personal taste and budget. Common fir is the most inexpensive of the plywoods and will make attractive walls and ceilings if finished correctly. At only a slight additional cost, you

can have fir plywoods with special surface textures—Plyweave, striated (combed) or sandblasted. Then there are the vertical-grain, or rift, fir panels; fir plywood that is quarter-sawed from logs in the same way as a select board, with tone and grain as rich as many a hardwood. Highly attractive softwood paneling is available in redwood and knotty-pine plywoods. Finally, there are many hardwood plywoods—gum, oak, birch, mahogany, walnut, korina—each distinctive in its grain and coloring, and providing a selection to blend with any interior decorating.

Plywood panels are worked easily with ordinary tools, are exceptionally strong and will provide the most scuffproof and crackproof of dry-wall construction. The major problem with plywood is that it goes

Seven of the many plywoods now available are pictured below. The samples, from left to right, are redwood Plyweave, fir Plyweave, rift-grain fir, rift-grain redwood, walnut, smoky birch and African mahogany







By  
**Tom Riley**

Color photos courtesy  
M & M Plywood Corp.

## PLYWOOD

on the walls so quickly that you are tempted to be careless. However, when you take time to use a good paneling method and finishing procedure, there will be no gaping joints or somber finishes.

The common 4 x 8-ft. panel is the right height for most walls and fits standard studding. Smaller panels also are fairly common, and extra-long panels (up to 12 ft.) are available for covering high walls as well as spanning the width of ceilings. Common fir plywood is available in two types—interior and waterproof exterior. The latter is necessary only around the bathtub and shower. Each type is graded (A, B, C and D) depending on the defects in the panel faces. As only one face is exposed, interior A-D plywood, which has one clear face (A grade) and the other



Wall in living room of *Popular Mechanics* ranch house is of 1/4-in. walnut plywood toned with a red-mahogany oil stain



The tasteful use of plywood in cabinets and wall paneling adds warmth to the room and sets off the stone fireplace



Kitchen cabinets are of rift-grain redwood plywood and exposed wall areas are of enameled rift-grain fir plywood







Fireplace wall of modern bedroom is of 24-in. squares of  $\frac{1}{4}$ -in. birch plywood over  $\frac{5}{16}$ -in. underlayer. Other walls are of full-sized panels

knotty (D grade), is the type to buy. There are also "reject" panels. These are satisfactory for cabinetwork where defects can be cut out, but they are not economical for wall paneling, as the full sheet usually is required.

**Two methods of wall paneling:** The center detail on page 154, shows two ways to panel your walls economically with plywood. With the single-layer method, sheets of  $\frac{3}{8}$ -in. plywood are fastened directly to the studs with 4d finishing nails. It is important to apply a good glue, preferably a plastic resin, liberally along the studs before nailing down the fitted panels. For the sake of economy,  $\frac{1}{4}$ -in. plywood can be used, but the panels will have a tendency to "boom" when struck and perhaps to bulge between the studs. This is especially true if the studs are spaced farther apart than the usual 16 in. on centers. The  $\frac{1}{4}$ -in. thickness, however, frequently is used under wallpaper and similar coverings.

The double-layer method is the best one to use with the more expensive hardwood plywoods, because it produces an excellent wall with only  $\frac{1}{4}$ -in. finish plywood. The underlayer is usually of  $\frac{3}{16}$ -in. Plyscord, which is simply a C-D grade (knotty on both sides) of fir plywood that has been left unsanded. This is the cheapest underlay, but if it is not available, you can substitute  $\frac{1}{4}$ -in. fir plywood or good, dry  $\frac{3}{4}$ -in. lumber. The underlay is secured to the studs with 6d common nails, without gluing, and is installed crosswise to the direction of the finish panels. The  $\frac{1}{4}$ -in. finish layer is nailed to the underlay and studs with 4d finishing nails or  $\frac{3}{4}$ -in. brads, with glue under all joints and at spots in between. Try to avoid having joints in both the underlay and finish paneling on the same stud. With both the single and double-layer methods, the nails are spaced 6 in. apart along all edges and are driven at 10-in. intervals to the studs in be-



tween. It is recommended practice to leave the paneling unglued but nailed at the room corners to permit expansion in case the wall framing should shift or settle. The double-layer method also should be employed whenever small squares or narrow boards are used for paneling, as the underlay allows the smaller pieces to be nailed and glued securely regardless of whether or not their edges fall on a stud.

**On new construction:** In the open walls of a new house or unfinished attic, insert short sections of 2 x 4 horizontally between the studs at a height of 4 ft. above the floor. If the panels are applied horizontally, the inserts will provide a backing for the joints; if not, the inserts will form additional bracing and also serve as fire stops. If using single-layer paneling, insert 2 x 4 backing pieces similarly at any spot where a joint will occur.

**On old plaster walls:** You will find it necessary to apply furring strips over plaster walls before paneling. These can be lengths of 1 x 2 or 2 to 3-in. strips of  $\frac{1}{4}$  or  $\frac{3}{8}$ -in. plywood. Full-length horizontal strips should be spaced 24 in. apart and short strips nailed vertically over the studs between the horizontal strips. Fasten the paneling to the strips with glue and nails.

**On masonry or concrete walls:** Use heavier furring strips, 1 x 2 or 2 x 2 stock, on concrete or masonry, spacing the strips as on plaster walls or simply nailing them ver-

tically on 16-in. centers. Use concrete nails or drill the wall, plug the holes with dowels and nail the furring to the plugs.

Masonry or concrete basement walls often are damp, so asphalted building paper should be applied underneath the furring strips. If the wall is definitely damp, it should be given a coat of waterproof cement paint and the backs of the plywood panels coated with aluminum paint. In extreme cases, waterproof plywood should be used.

**Paneling layouts:** The way in which the paneling is laid out on the walls is entirely a matter of the type of effect you desire. When you intend to accent the panel joints, always panel above and below the openings first, using vertical joints from floor or ceiling to the openings. Then divide remaining wall spaces into the desired pattern.

**Joints:** When using smooth paneling, the finished wall usually will be most attractive if the joints are accented rather than concealed. Plyweave and striated plywoods present no joint problem, as their texture makes any joint practically invisible. For perfect fitting flush joints, plane the back edge of each panel at the joint to produce a slight bevel. This will assure a tight fit at the front edge, glue filling in the space behind. On painted panels, flush joints may be taped the same as plasterboard. All wall paneling should clear the floor by  $\frac{1}{4}$  to  $\frac{1}{2}$  in., the lower joints being covered by the baseboard.

Traditional wall paneling in this room consists of  $\frac{3}{8}$ -in. rift-grain fir plywood glued and nailed to the studs. Panels are outlined by nailing  $\frac{3}{4}$ -in. boards over the plywood and adding stock or picture molding



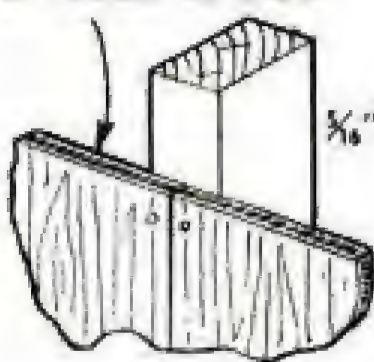




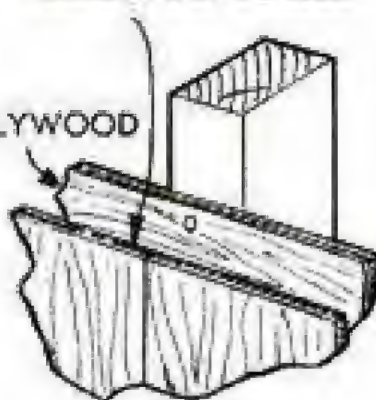
Recessed shelves and paneling of  $\frac{1}{4}$ -in. oak plywood form distinctive entrance to this living room

$\frac{1}{4}$ " OR  $\frac{3}{8}$ " PLYWOOD GLUED AND NAILED TO STUD

$\frac{1}{4}$ " FINISH PLYWOOD, GLUED AND NAILED



SINGLE LAYER



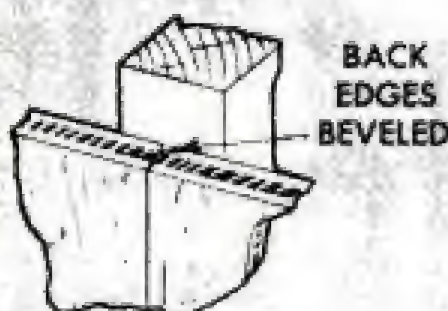
DOUBLE LAYER

**Ceilings:** Plywood is applied to ceilings in the same way as to walls. However, because ceiling joists usually are lengthy beams with some warp and due to the fact that 2 x 4 blocking between the joists would be required at all panel joints, it usually is easier to apply furring to the ceiling joists in all cases. It is best to install 1 x 3s crosswise to the joists, spacing them 24 in. apart and nailing short lengths of 1 x 3 along alternate joists. Glue and nail the ceiling panels to the furring strips, spacing the nails at 6-in. intervals on the joints and 10 in. between them. Often, ceiling panels are applied in small rectangles or squares to obtain a tiled pattern, but it is easier to simulate tile by scoring full-size panels with a portable electric router or saw. Cut the grooves to the same 24 x 32-in. pattern as the furring so you can nail the panels in the grooves. Ceilings also can be paneled with any of the joints shown for the walls. Always panel the ceiling before the walls, as it is easier to fit the wall panels to the ceiling panels. To handle a large ceiling panel by yourself, build a "horse" like the one detailed on page 156.

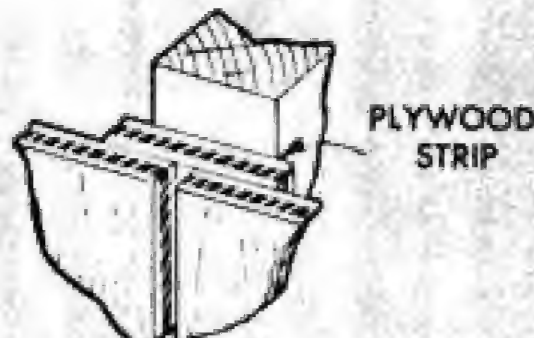
**Finishing:** The finish on any wood-paneled wall is important. On rotary-cut fir plywood and also on rift-grain fir, redwood, gum and birch, a good natural-wood finish is obtained by applying a coat of thinned clear shellac or resin sealer, followed by a coat of white sealer or white paint which is rubbed on with a cloth and wiped off to the desired tone. Third, a finish coat of dull varnish, shellac or lacquer is applied. The white coat softens any orange coloring and



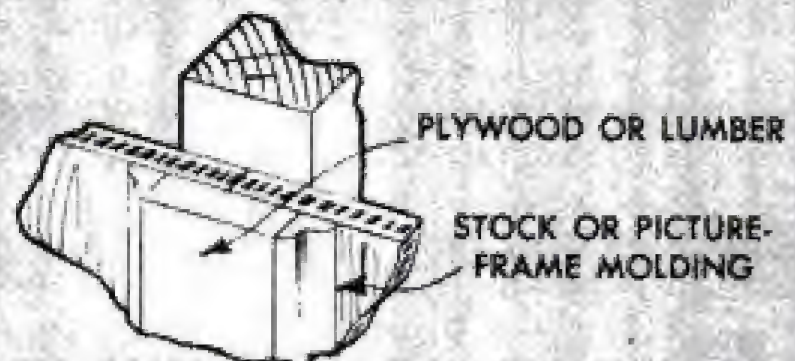
## Basic Paneling Layouts



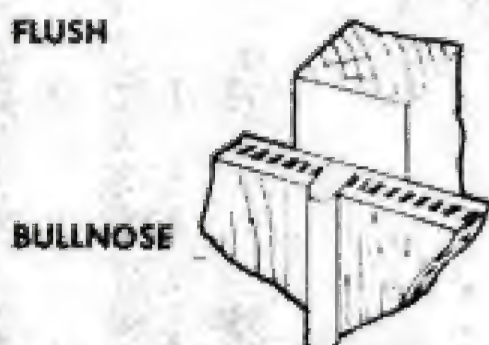
FLUSH



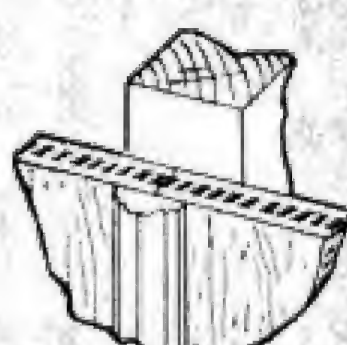
OPEN



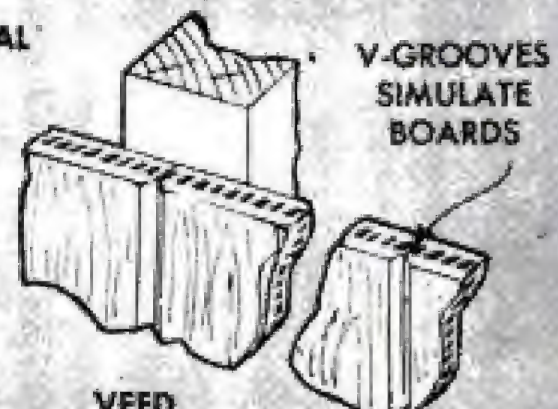
TRADITIONAL



BULLNOSE



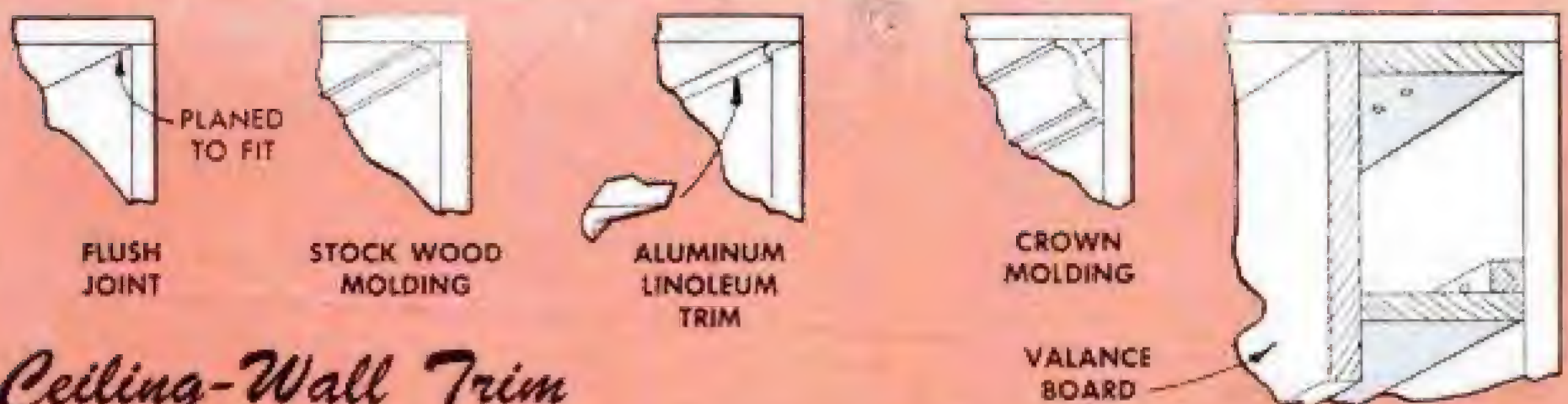
STOCK MOLDING



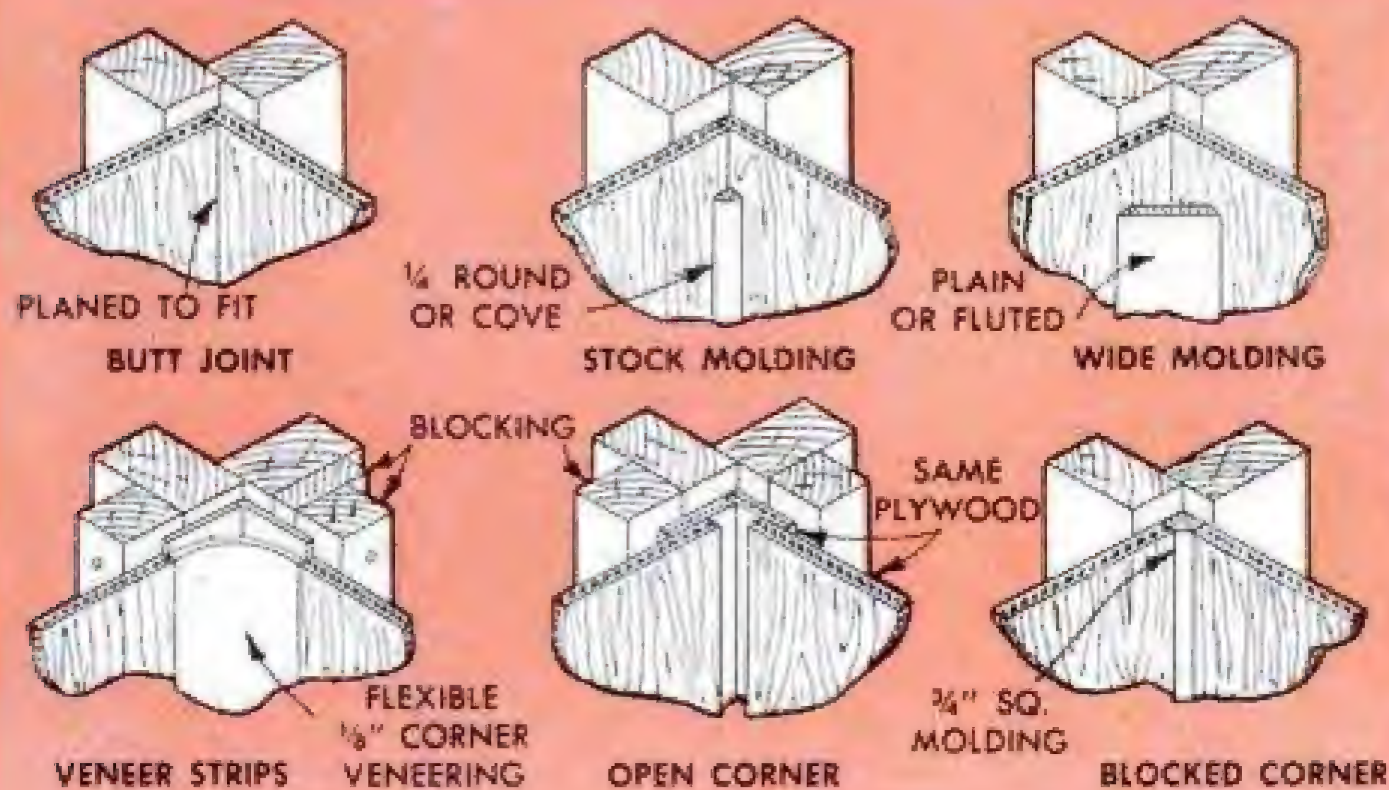
VEED

## Joint Treatments

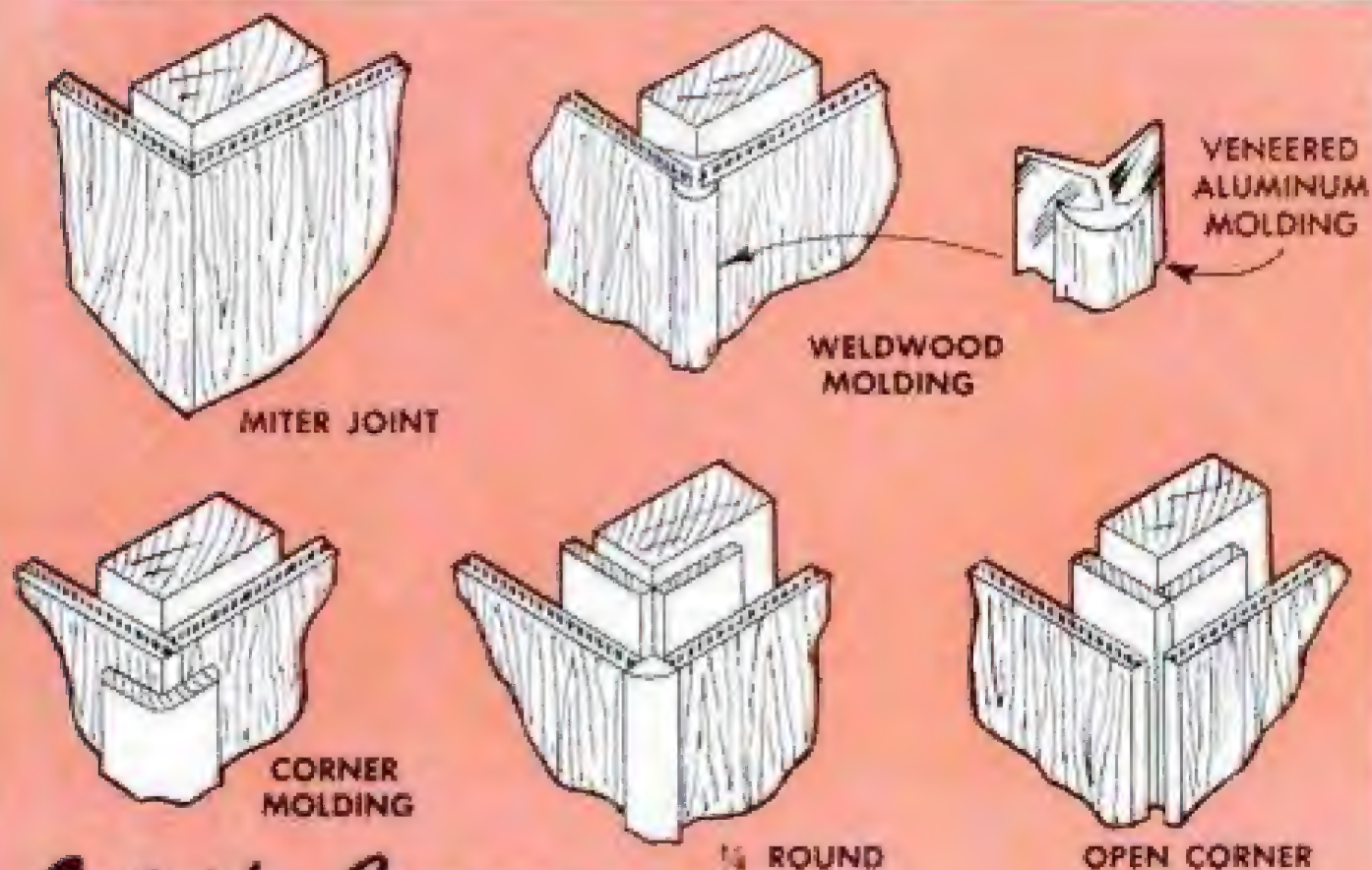




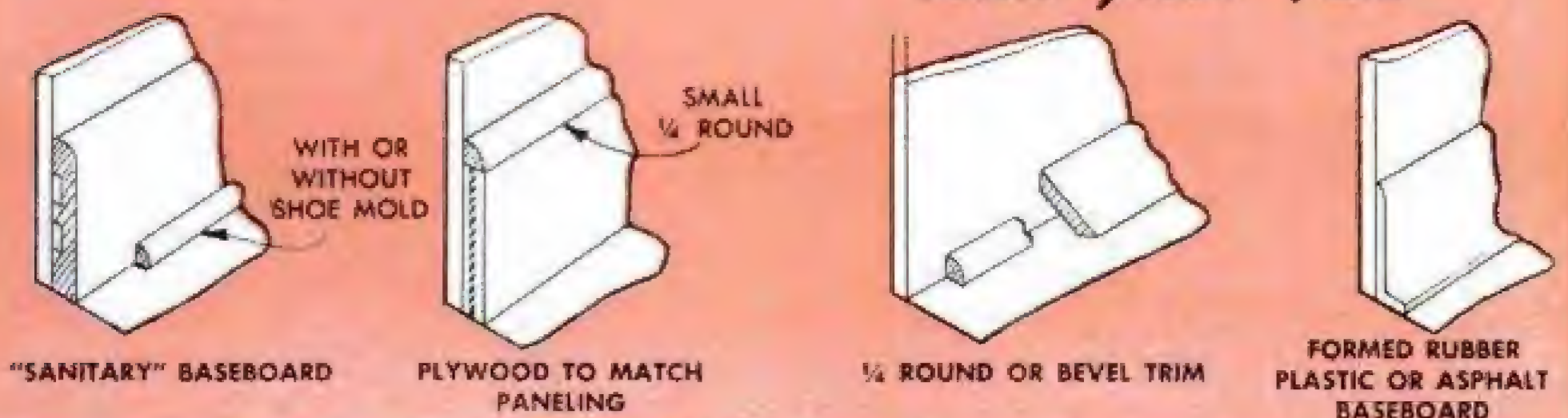
## Ceiling-Wall Trim



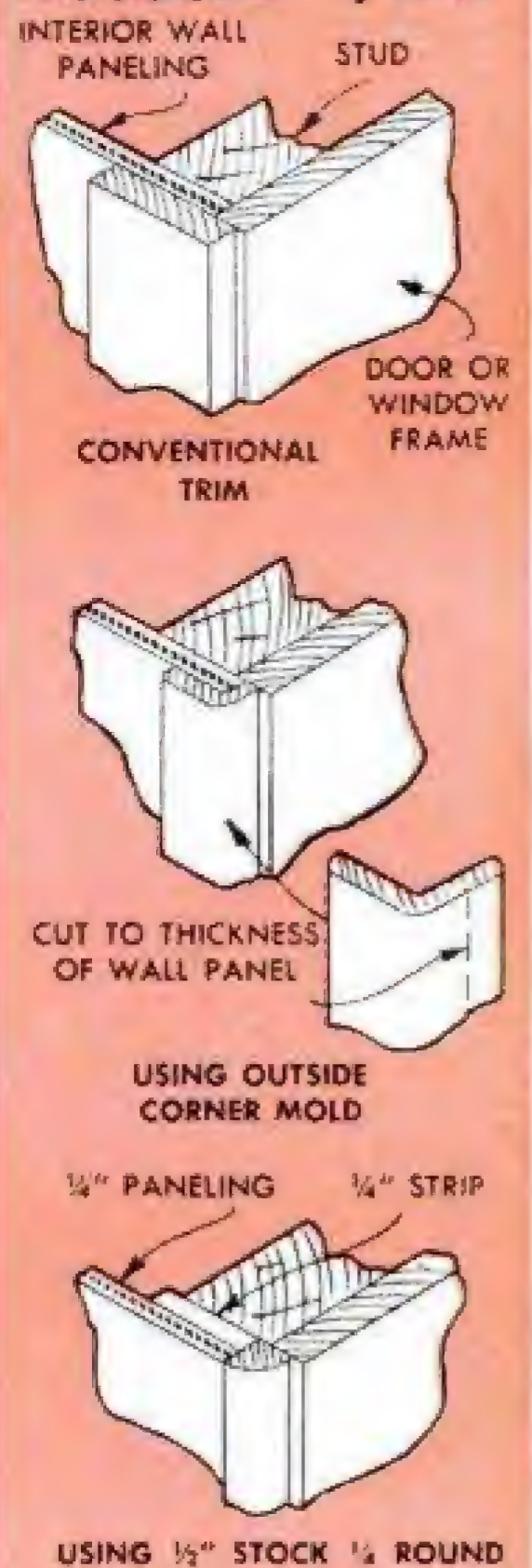
## Inside Corners



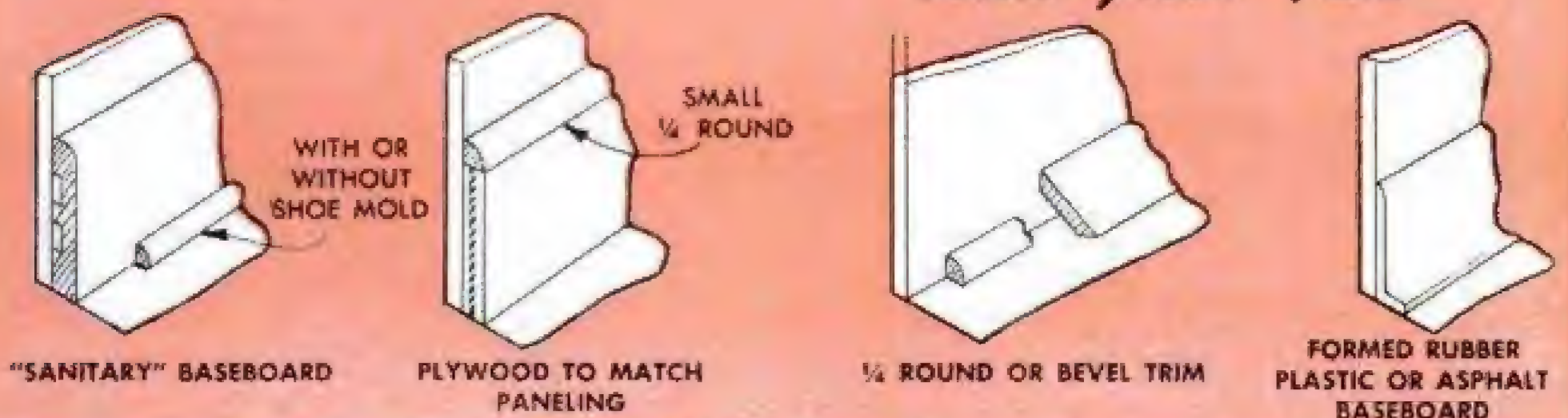
## Outside Corners



## Door and Window Trim



## Wall-Floor Trim







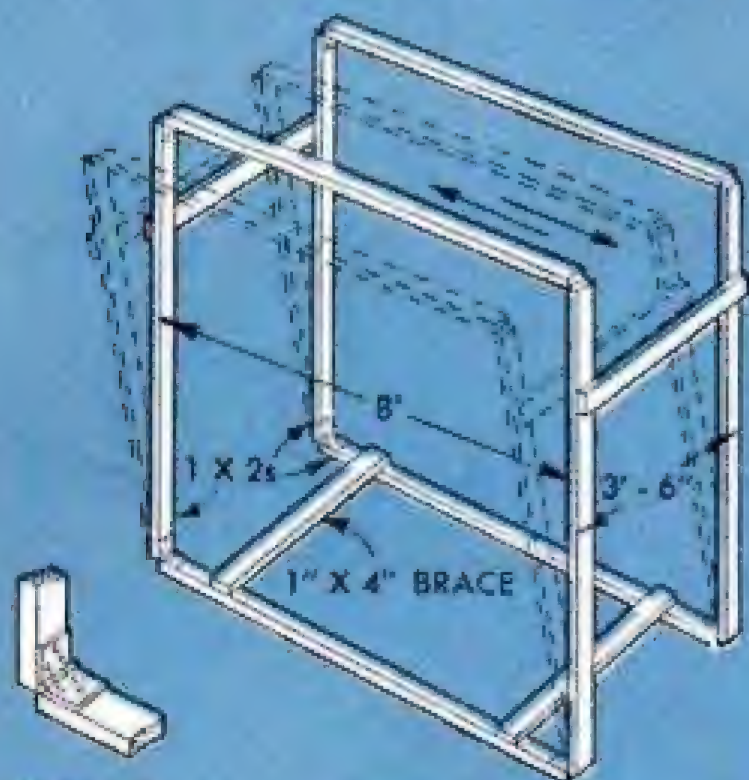
Note in photo at left how plywood panels are fastened to 1 x 3 furring strips nailed to ceiling joists

CEILINGS PANELED WITH 4' X 8' SHEETS

1" X 3" FURRING STRIPS NAILED TO ALTERNATE JOISTS



3/4" PLYWOOD NAILED AND GLUED TO FURRING STRIPS



HINGED AT CORNERS

CEILING HORSE ALLOWS ONE MAN TO APPLY LARGE PANELS



neutralizes the tendency of fir to darken. Walls of oak and mahogany can be finished similarly, except that a white filler should be added to the second coat.

For a simple blond finish, brush on a first coat of white resin sealer or thinned undercoat. After a few minutes, rub this down with rags to the tone desired and follow, when dry, with a finish coat of shellac or lacquer. A rich, natural finish on the various hardwood panels is obtained easily by applying one coat of wallpaper lacquer.

An excellent way to stain common fir and any other plywood in a variety of pastel tones is to use ordinary oil paint. Brush on a first coat of any color paint or enamel undercoat, thinned half and half with turpentine. After approximately 15 min., wipe it down to the tone desired and apply a finish coat of varnish, shellac or lacquer. The photos on page 152 show various effects of this method on rotary-cut redwood plywood. The sample at the top is a natural redwood panel; A, stained with dark-yellow paint; B, green; C, gray paint; D, red-mahogany stain; E, light-yellow paint. Various finishes and grain effects are obtained by using different colors and varying the amount of wiping. Another attractive finish is achieved by applying any of the new wax stains and rubbing them to the tone desired. With any staining or toning, experiment first on scraps of plywood. On Ply-weave or striated plywood, a soft two-tone finish is produced by applying a white undercoat and then a coat of the color desired. The latter is wiped down to expose the white on the high spots.

For glass-smooth enameled walls, rift-grain fir, gumwood and birch plywoods are best. Apply a first coat of resin sealer to prevent grain rise; next, apply undercoat, 1 part, and enamel, 1 part; then, a finish coat of enamel. For a smooth, enameled surface on rotary-cut fir, first prime the plywood with thin white paint and apply painter's muslin over it, using wallpaper paste. When dry, glue-size the muslin and then apply any conventional enamel finish.

Common fir plywood, with its joints glued, is an excellent base for wallpaper. Apply rough-textured papers directly to the sized panels, and smooth papers to a layer of wallpaper liner or felt. Ceilings can be finished in the same way as walls; however, they usually are preferred in a neutral, plasterlike finish. Here, plastic or resin-base texture paints should be used, applying them with a roller or brushing on and stippling. ★ ★ ★

To obtain plastered effect, texture paint is brushed on heavily and then surfaced with flat rubber sponge



## Making Plastic Money Clip

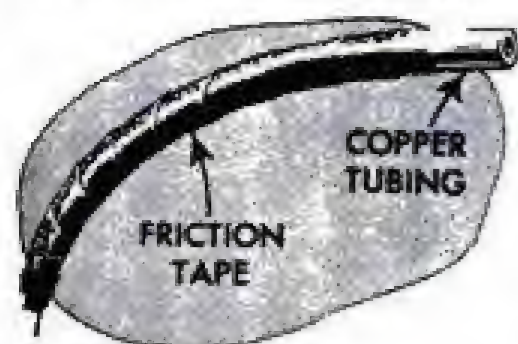


Made from a  $1\frac{1}{4}$  x  $4\frac{1}{2}$ -in. piece of  $\frac{1}{16}$ -in. plastic, this money clip for personal use or gift purposes is a neat "quickie" project for the home craftsman. Round the corners of the plastic and smooth all edges with fine

sandpaper. Heat the plastic 1 in. back from each end and make a slight bend. Then heat and bend the center portion over a  $\frac{1}{4}$ -in. dowel. To add a smart finishing touch, cement chrome initials to the clip.

Frank Shore, New York City.

## Tape Wrapped Around Tubing Prevents Kinking When Bent



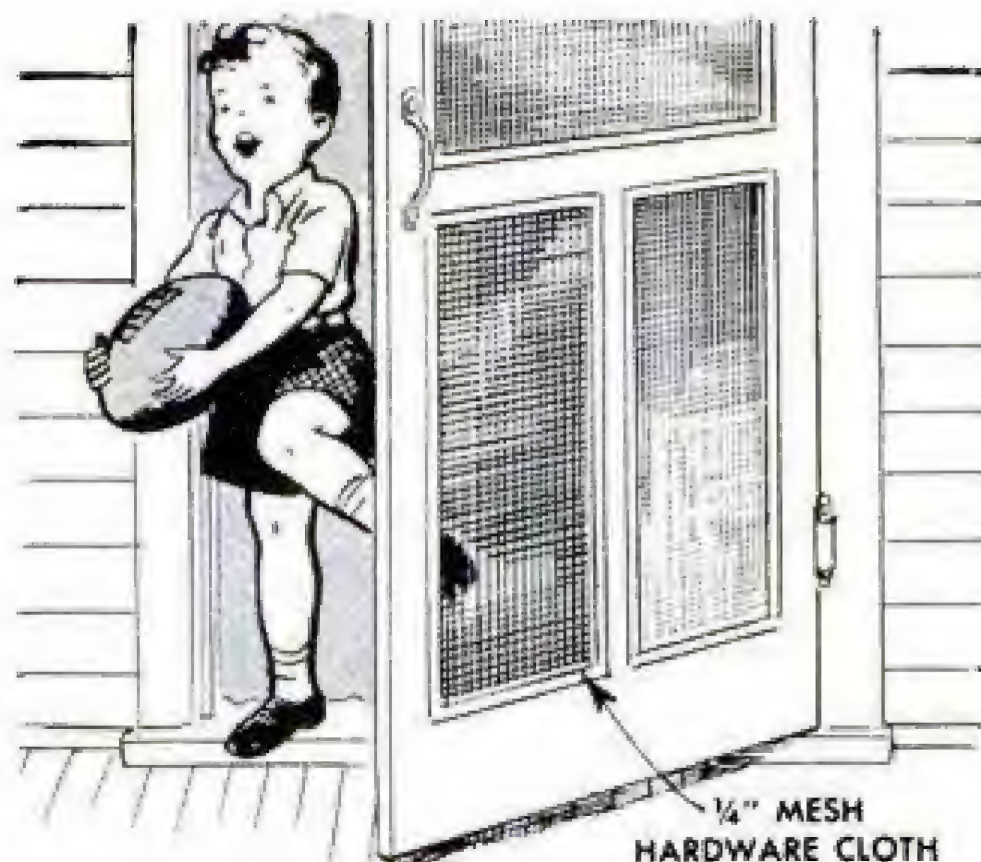
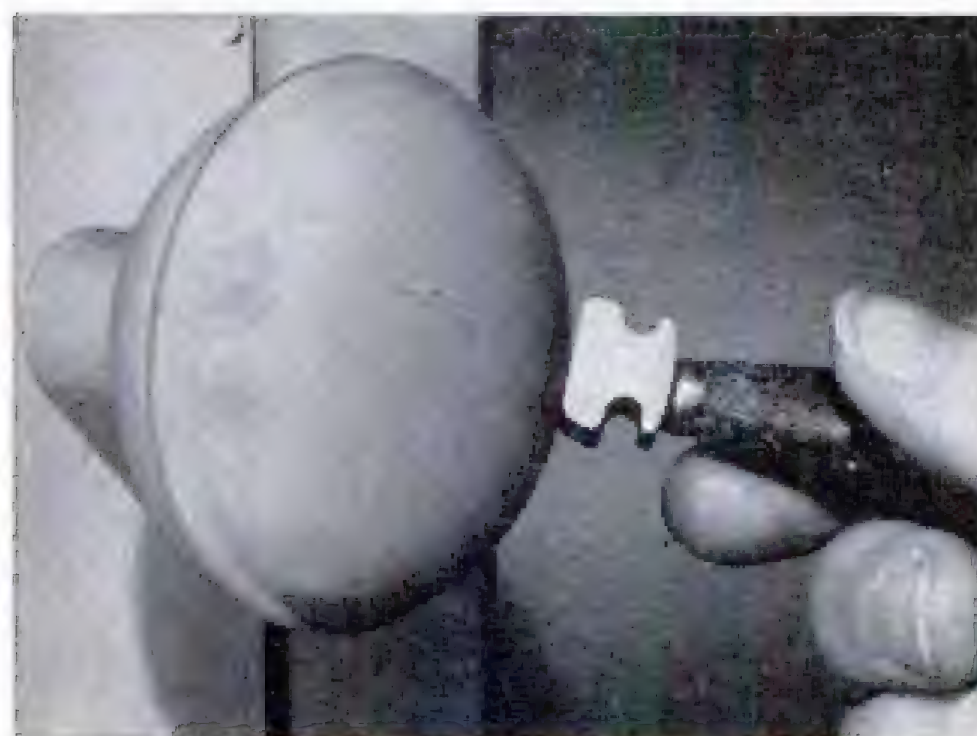
If you wish to bend a length of copper tubing without kinking it, wrap the portion to be bent with several thicknesses of friction tape.

The tape, which is wrapped spirally, will yield to the bending but will offer sufficient resistance to support the tube equally at all points. This minimizes the possibility of excessive strain at any one point.

## Magnet Tests Genuineness Of Brass Hardware

One way of telling whether or not hardware, such as doorknobs, drawer pulls, etc., is brass or simply plated steel is to hold a magnet against it. The magnet will cling to steel, whereas brass or aluminum will have no effect upon it.

R. F. Donavan, Guttenberg, N. J.

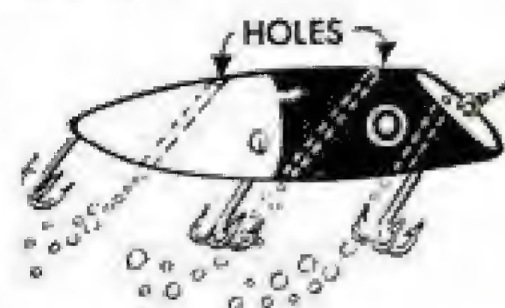


## Hardware Cloth on Screen Door Reinforces Lower Section

Sooner or later youngsters will puncture and sometimes tear out the lower section of a screen door, usually by kicking or pushing hard against the door before it is fully released from the catch. One way in which this may be forestalled is by reinforcing the lower panel with  $\frac{3}{8}$  or  $\frac{1}{2}$ -in. galvanized hardware cloth. To install it, simply remove the molding, tack the cloth over the door screening and then replace the molding.—R. M. Woodbury, Natick, Mass.

## Popping Plug Attracts Fish

Any wooden or plastic fishing plug can be converted into a popping bait by drilling three  $\frac{1}{4}$ -in. holes  $\frac{1}{2}$  in. apart diagonally



through the body of the plug. These holes will cause the bait to pop and gurgle and leave a trail of bubbles, which will attract fish as the bait is reeled in.

Russ Jenkins, Chicago.

## Removing Blisters From Veneers

To remove blisters from newly varnished veneers, split the blister lengthwise with a razor blade and insert liquid hide glue under the raised portion, using a stick or small brush. Next, cover the break with several layers of newspaper and place a weight on it. When the glue has set, remove the paper from the blister by soaking it with olive oil and scraping lightly with a razor blade. Then sand the area carefully, starting at the center and working toward the edges. If the patched surface is discolored, touch it up with varnish or shellac.

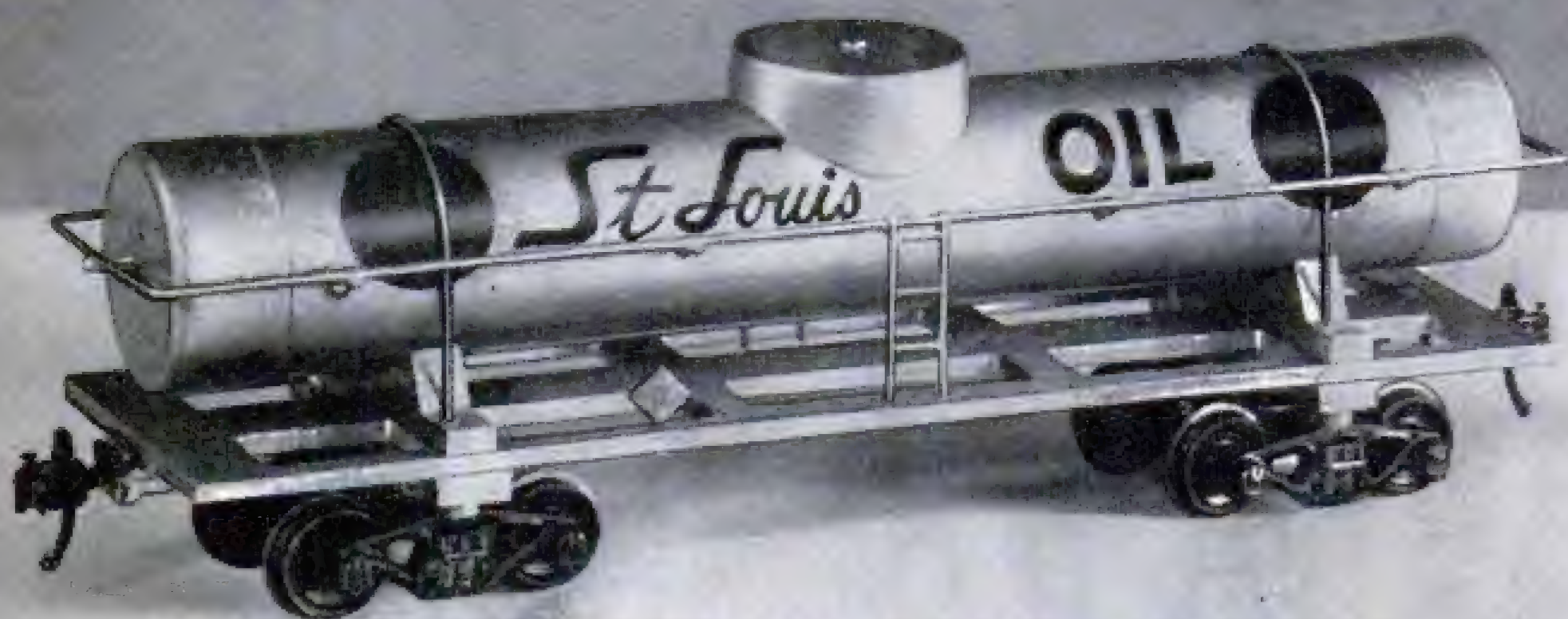
John A. Comstock, Wellsboro, Pa.



# THE GHOST OF OLD No. 278

## PART II

In this issue we present full-size plans for four cars, the rolling stock that old No. 278 pulls on her daily hauls. Included are a tank car, a boxcar, a refrigerator car and a caboose you can build for your HO-gauge layout



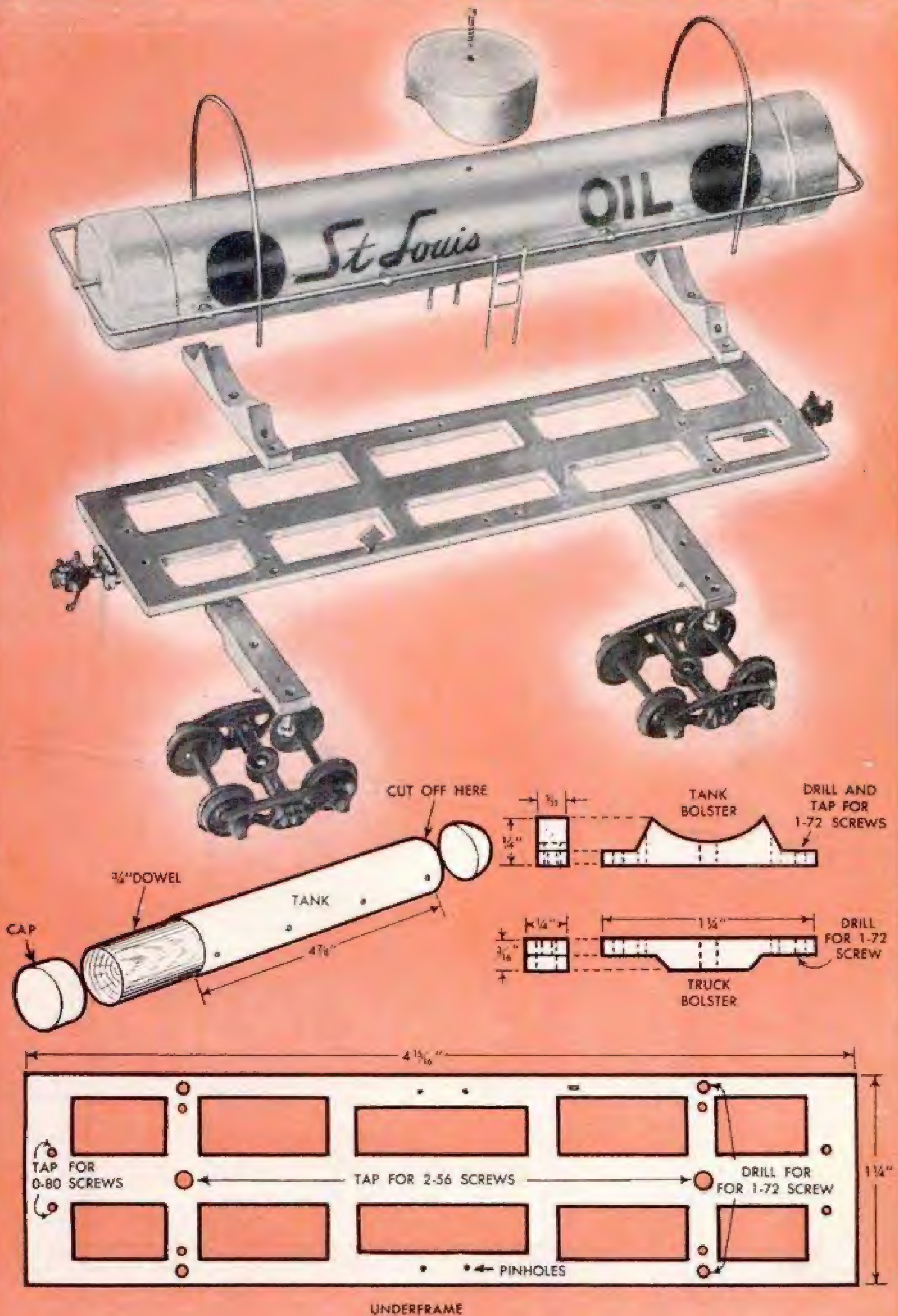
**By Frank Beatty  
and  
Leonard F. Hilts**

**B**Y NOW the HO model of old No. 278, the Chicago and Northwestern Railroad's little narrow-gauge engine described last month, is operating smoothly on your layout and eagerly looking for work. This month we present full-size plans for the construction of four cars—rolling stock so No. 278 can start hauling pay loads for you.

**Tank car:** The underframe of the tank car is cut from  $\frac{1}{16}$ -in. sheet zinc or brass according to the full-size pattern on the opposite page. As shown, it is tapped at each end for attaching the couplers, which are purchased, and for the 2-56 screws by which the trucks are pivoted. Holes are drilled for the four 1-72 screws which pass through the truck bolsters. Located slightly inboard of these, smaller holes receive the ends of the wire tank straps. Pinholes are made for the ends of the ladder rails, and a small hole is drilled to take the diamond-shaped marker plate, which can be seen in the photograph.

The tank is an aluminum cigar tube with the rounded end cut off, leaving a cylinder  $4\frac{7}{8}$  in. long. A  $\frac{3}{4} \times 4\frac{7}{8}$ -in. dowel is inserted in the cylinder and the cigar-tube caps are cemented over each end. The tank dome is a third cigar-tube cap, cut to fit the curve of the tank and held in place by a small wood screw. The truck and tank bolsters are shaped from solid brass, following the patterns given. The tank bolster is tapped in the center for the 2-56 truck screw, and at each side for a 1-72 screw. The truck bolster is drilled but not tapped for the same screws. To begin assembly of the car, the brass truck and tank bolsters are located on the frame. Then the 1-72 screws are pushed up through the truck bolsters and the frame and threaded into the tank bolsters. The tank now is fastened to the frame by means of two wire tank straps. The wires are passed through the holes drilled for them on one side and then bent around the truck bolsters. The other ends are brought around the tank, passed through holes on the other side and pulled tight. They are bent around the bolsters on that side. Four straight pins are

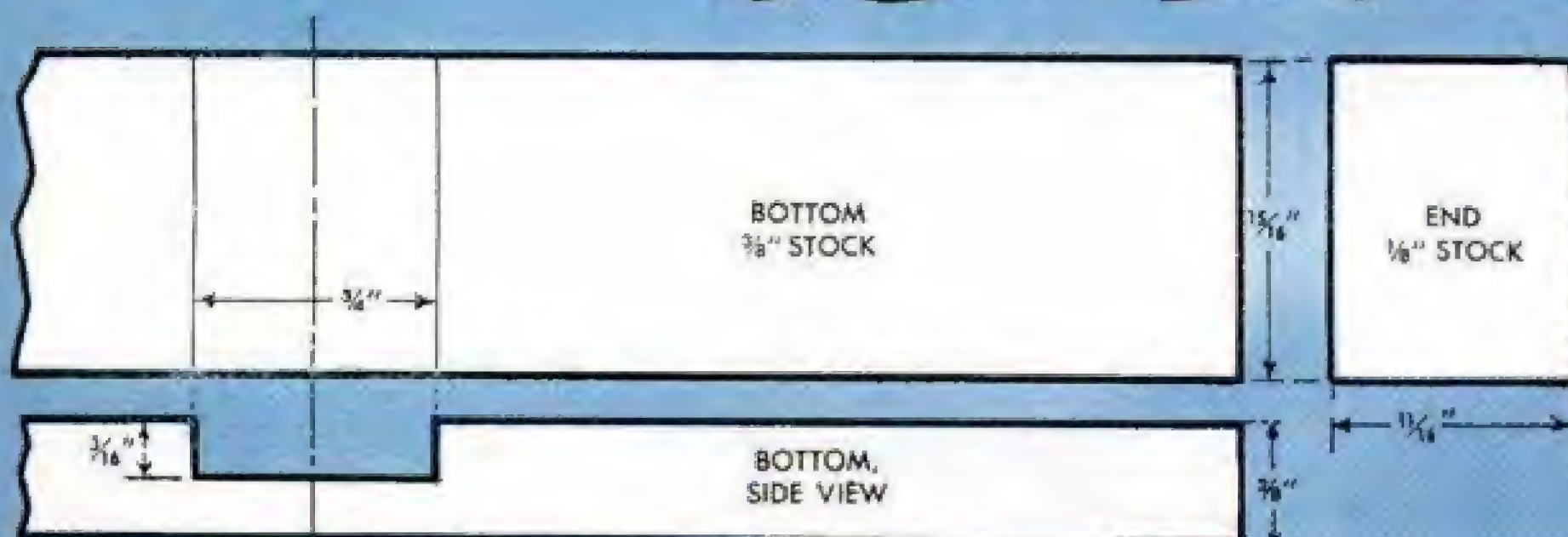
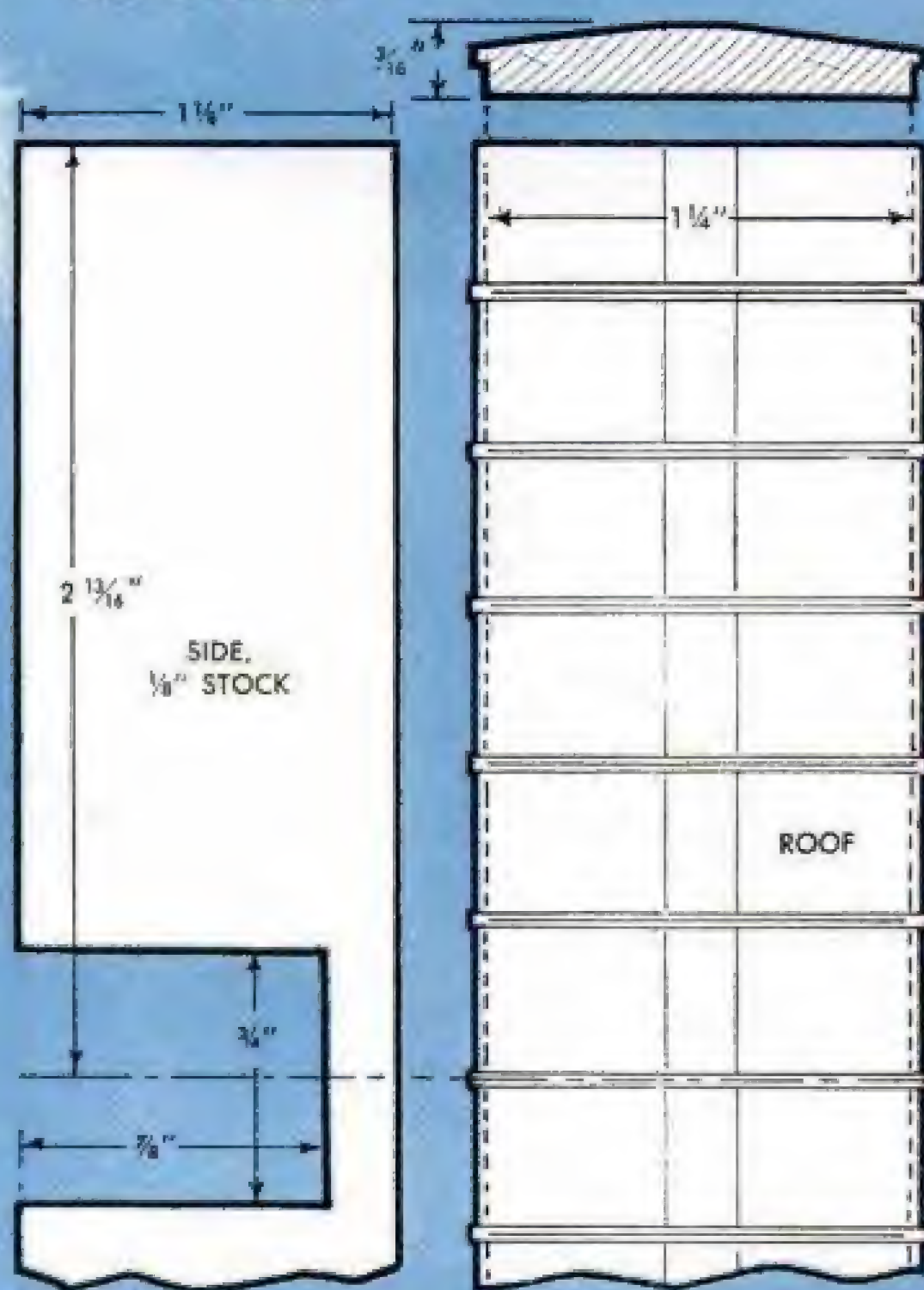
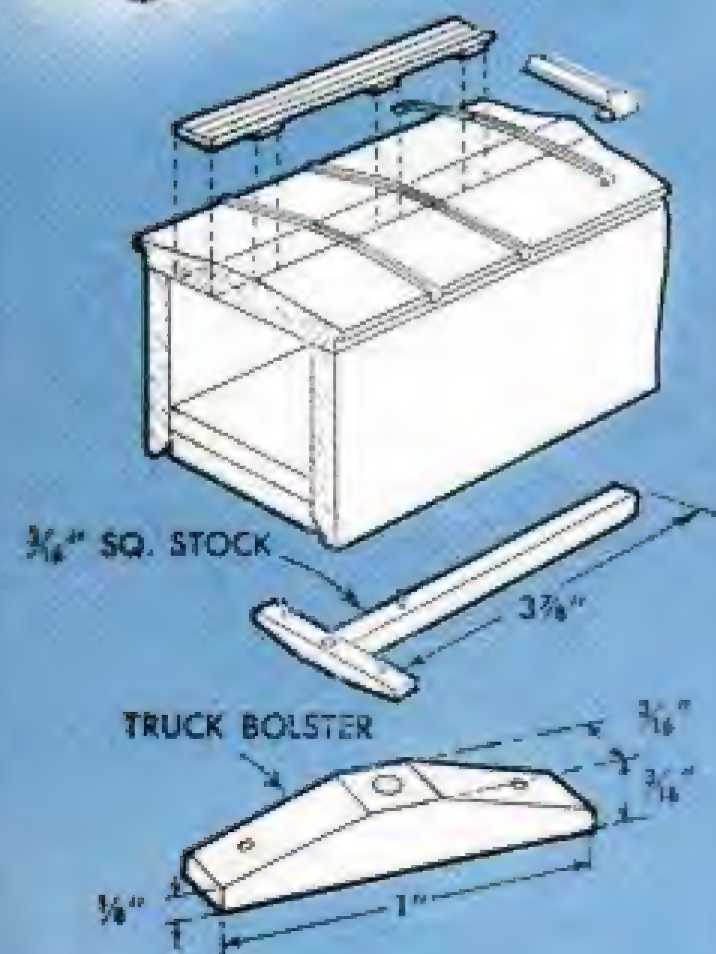








REFRIGERATOR CAR AND BOXCAR,  
FULL-SIZE PATTERNS

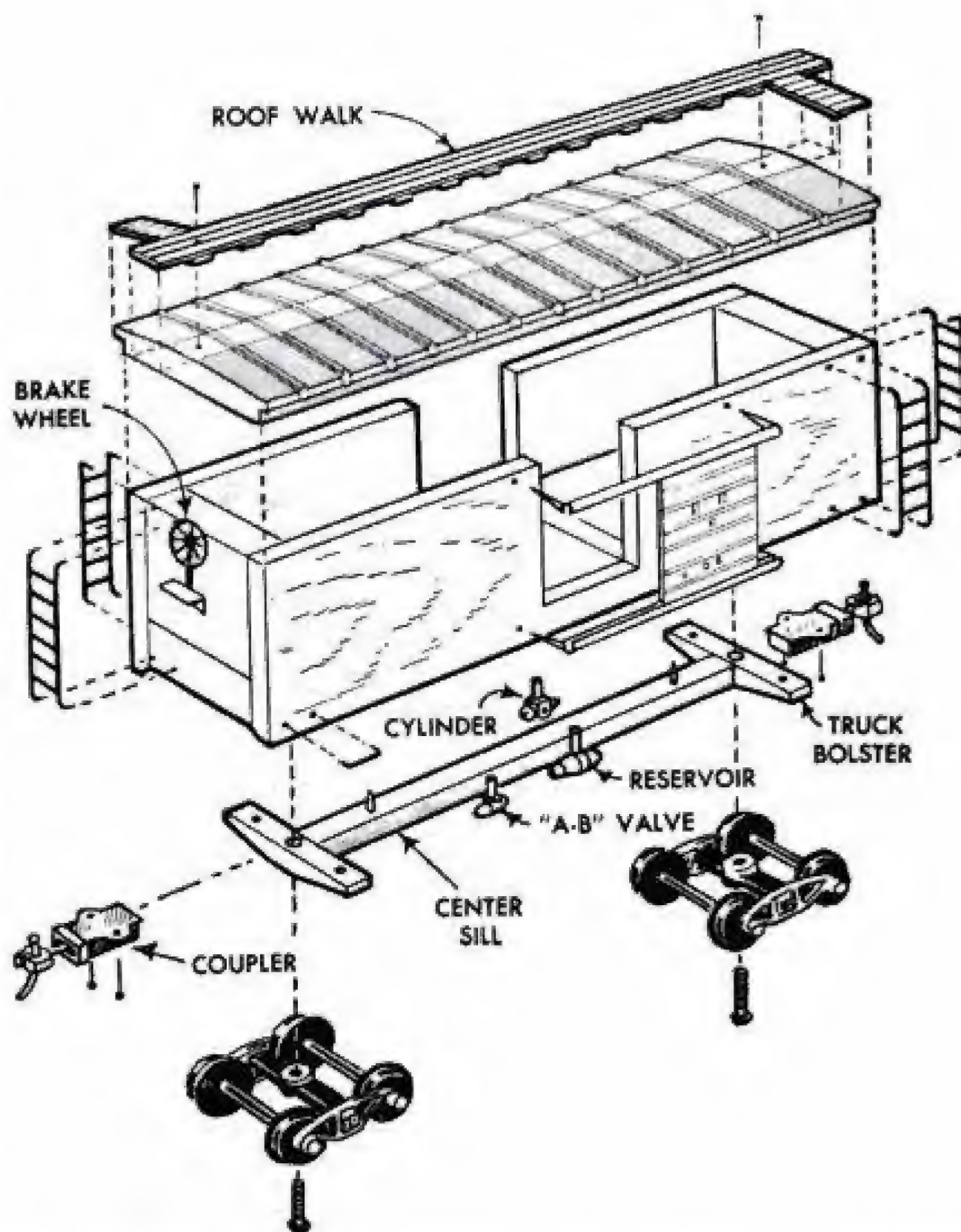




inserted in each side of the tank, and one at each end, to serve as braces for the handrail which circles it. These pins project  $\frac{1}{8}$  in. from the tank, and the rail is soldered to them. The bottom ends of the side ladders are passed through the holes in the underframe and bent over, and the tops of the ladders are soldered to the handrail. After the couplers and trucks are screwed in place, the entire car is painted silver and lettered.

#### Boxcar and refrigerator car:

The boxcar and the refrigerator car are constructed in the same manner, the main difference being that the former has doors that open. Full-size patterns for the roof, bottom, ends and sides of the boxcar are shown on the opposite page. The same patterns are used for the refrigerator car, except that the cutouts in the sides and bottom for the doors are not made. The roof is a standard item that can be purchased preshaped from any hobby shop. The body of the car is assembled by cementing the endpieces to the bottom first, then gluing the sides in place, and finally adding the roof. Pins can be inserted through the sides into the bottom to reinforce the joints. Two doors, measuring  $\frac{7}{8} \times 1\frac{1}{8}$  in., can be purchased already embossed or they can be cut from Bristol board and painted the same color as the car. In this case the embossed design is drawn in with India ink after the paint is dry. The doors move freely in door slides (small brass channels) that are mounted on the car at the top and bottom of each door, as in the exploded detail above. The stamped-brass roof ribs, which are purchased, are laid across the roof  $\frac{7}{16}$  in. on centers and their ends are pinched around the edge of the roof. As supports for the roof walk,  $\frac{1}{32} \times \frac{1}{16} \times \frac{3}{16}$ -in. wooden cleats are cemented between the ribs. The roof walk is a strip of wood or plastic, scored to simulate boards running the length of the car, and is cemented directly to the support blocks. It is  $\frac{3}{16}$  in. wide and projects  $\frac{1}{8}$  in. over each end of the car. End walks,  $\frac{1}{32} \times \frac{1}{4} \times \frac{1}{2}$  in. are cemented to supports in the same manner as the roof walk, on opposite sides of each end of the car. In the refrigerator car, cast-plastic ice doors are purchased and used in place of the end walks. The body of the car



is now painted, the boxcar a standard brown or red, and the "reefer" yellow. The door design is drawn on the side of the refrigerator car in India ink after the paint dries. You can hand-letter your cars, or purchase decals for the purpose from any hobby shop. Now truck bolsters are cut from type lead, using the pattern shown, and are mounted across the bottom of the car,  $\frac{3}{4}$  in. on centers from each end. Running between them is the center sill, a  $\frac{3}{16}$ -in.-sq. strip of type lead,  $3\frac{7}{8}$  in. long. The underside detail is now added and the underside is painted black. Couplers and trucks are put in place, and the final details are added before the car is put on the rails.

**Caboose:** The method of construction for the caboose is the same as for the boxcar and refrigerator car. The roof, sides and bottom are cut according to the full-size patterns. The endpieces are of  $\frac{1}{8}$ -in. stock cut to the dimensions given. They are cemented to the bottom, the sides are glued in place and finally the roof is installed. The roof of the caboose is a standard HO-scale roof cut down to fit the pattern. The bay windows can be bought or they can be shaped as shown from sheet brass and cemented in place. Frames for the car windows can be purchased and inserted in the







window openings, or frame can be simulated by drawing around the opening with India ink. The doorframes are Bristol board cemented to the car ends. The end platforms and steps are one-piece castings that are purchased and fitted over the tongues on the car bottom. The roof walk can be cemented directly to the car roof, or small cleats, as used on the boxcar, can be put down first,  $\frac{7}{16}$  in. on centers. The roof walk projects  $\frac{1}{8}$  in. beyond each end of the car. The lead center sill shown in the pattern is tapped to take the 2-56 screws which hold the trucks in place. Truck bolsters can be added and the center sill cut to allow for them if desired. The body of the caboose is painted red, while the underside and end platforms are dull black. Finally the wire handrails on the platforms, the grab irons and the stack are put on. Then the couplers are added and the car is finished. ★ ★ ★

### Material List

#### Tank car

- 1 pc.— $\frac{1}{16}$ " x  $1\frac{1}{4}$ " x  $4\frac{1}{16}$ "—sheet brass
- 1—empty aluminum cigar tube
- 3—caps from cigar tubes
- 1— $\frac{3}{4}$ " dowel,  $4\frac{7}{8}$ " long
- 2 pcs.— $\frac{3}{16}$ " x  $\frac{1}{4}$ " x  $1\frac{1}{4}$ "—solid brass
- 2 pcs.— $\frac{3}{16}$ " x  $\frac{1}{4}$ " x  $1\frac{1}{4}$ "—solid brass
- 4—0-80 screws for bolster assemblies
- 4—1-72 screws for bolster assemblies
- 4—2-56 screws for trucks
- 2—HO-gauge couplers
- 2—4-wheel trucks
- 2—ladders,  $\frac{5}{8}$ " long
- 12"—soft wire for tank handrail
- 8"—soft wire for tank straps
- 10—pins for handrail braces
- 1 pc.— $\frac{1}{4}$ " x  $\frac{3}{16}$ "—Sheet brass for marker

#### Boxcar

- 1 pc.— $\frac{3}{8}$ " x  $1\frac{5}{16}$ " x  $5\frac{1}{2}$ "—wood
- 1 pc.—HO-scale roofing,  $5\frac{1}{2}$ " long
- 2 pcs.— $\frac{1}{8}$ " x  $1\frac{1}{8}$ " x  $5\frac{1}{2}$ "—wood
- 2 pcs.— $\frac{1}{8}$ " x  $1\frac{1}{16}$ " x  $1\frac{5}{16}$ "—wood
- 1 pc.— $\frac{3}{16}$ " sq. wood,  $3\frac{7}{8}$ " long
- 11—stamped-brass roof ribs
- 1 pc.—wood or plastic,  $5\frac{3}{4}$ " long, for roof walk
- 16 pcs.— $\frac{1}{32}$ " x  $\frac{1}{16}$ " x  $\frac{3}{16}$ "—wood or plastic roof-walk supports
- 2— $\frac{1}{4}$ " x  $\frac{1}{2}$ " wood or plastic end walks
- 2—doors,  $\frac{7}{8}$ " x  $1\frac{1}{8}$ "
- 4—door slides,  $1\frac{3}{4}$ " long
- 4—ladders,  $1\frac{1}{8}$ " long
- 1—brake wheel, scale size
- 2—HO-gauge couplers
- 2—HO-gauge 4-wheel trucks
- 2—wire grab irons
- 2—2-56 screws for trucks
- 4—0-80 screws for couplers
- 1—set of underside fittings

#### Refrigerator car

Material list is the same as above, except that no doors or door slides are needed, and molded plastic ice doors are used in place of end walks

#### Caboose

- 1 pc.—HO-scale roofing,  $4\frac{7}{8}$ " long
- 1 pc.— $\frac{1}{8}$ " x  $1\frac{1}{16}$ " x  $4\frac{7}{8}$ "—wood
- 2 pcs.— $\frac{1}{8}$ " x  $\frac{7}{8}$ " x  $1\frac{1}{16}$ "—wood
- 2 pcs.— $1\frac{1}{8}$ " x  $3\frac{3}{8}$ "—heavy drawing board
- 2 pcs.— $\frac{1}{16}$ " x  $1\frac{1}{16}$ "—heavy drawing board
- 4—cast window frames
- 2—bay window castings
- 1 pc.—plastic or wood,  $5\frac{1}{8}$ " long, for roof walk
- 9 pcs.— $\frac{1}{32}$ " x  $\frac{1}{16}$ " x  $\frac{3}{16}$ " plastic or wood roof-walk supports
- 2—cast caboose platforms with steps
- 2—HO-gauge couplers
- 2—HO-gauge 4-wheel trucks
- 1 $\frac{1}{2}$ "—steel rod,  $\frac{1}{16}$  dia., for stack
- 1 pc.— $\frac{3}{16}$ " sq. lead,  $3\frac{1}{8}$ " long
- 2—2-56 screws for trucks
- 4—0-80 screws for couplers
- 8"—wire for grab irons and handrails
- 1 $\frac{1}{2}$ "—steel rod,  $\frac{1}{16}$  dia., for stack

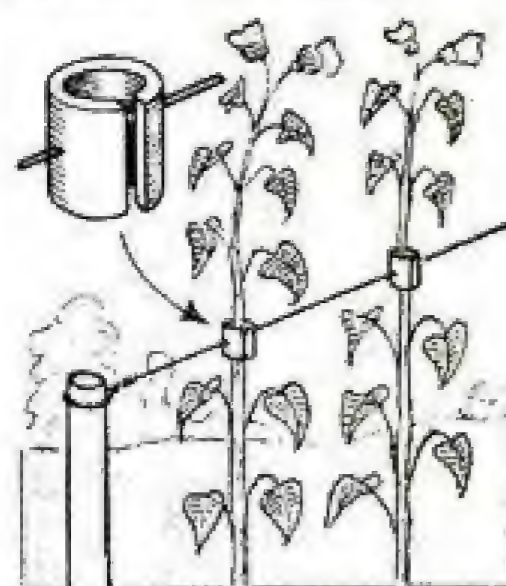


### Concrete Floor Acid-Etched To Prepare for Painting

Both exterior and interior concrete floors should be acid-etched prior to painting, to improve paint adhesion and to neutralize alkalis which have a destructive action on paint. A solution of muriatic acid, 1 part, and water, 3 parts, is mixed in a wooden or enameled pail and applied, 1 gal. per 100 sq. ft. of floor area. Scrub well with a stiff-bristled, long-handled brush and allow it to remain on the floor until bubbling stops. Then flush the floor thoroughly with clean water. If the surface does not dry in a few hours, it should be flushed again. *Caution:* When mixing the solution and also when working with it, rubber gloves and rubber overshoes should be worn, as contact with it will cause burns.

### Tall Flowers Protected in Wind

To prevent wind damage to hollyhocks and other tall flowers, a supporting trellis of wire and short sections of discarded garden hose can be constructed. Drill holes through one side of each hose section and slit these open length-



wise. String the sections on the wire, which is then stretched between two posts at a height of two ft. or more above the ground. Space the hose sections so that each one will engage a flower stalk, as shown.

☛ To remove dents from table-tennis balls, drop them in boiling water for a few minutes, turning them to heat evenly.



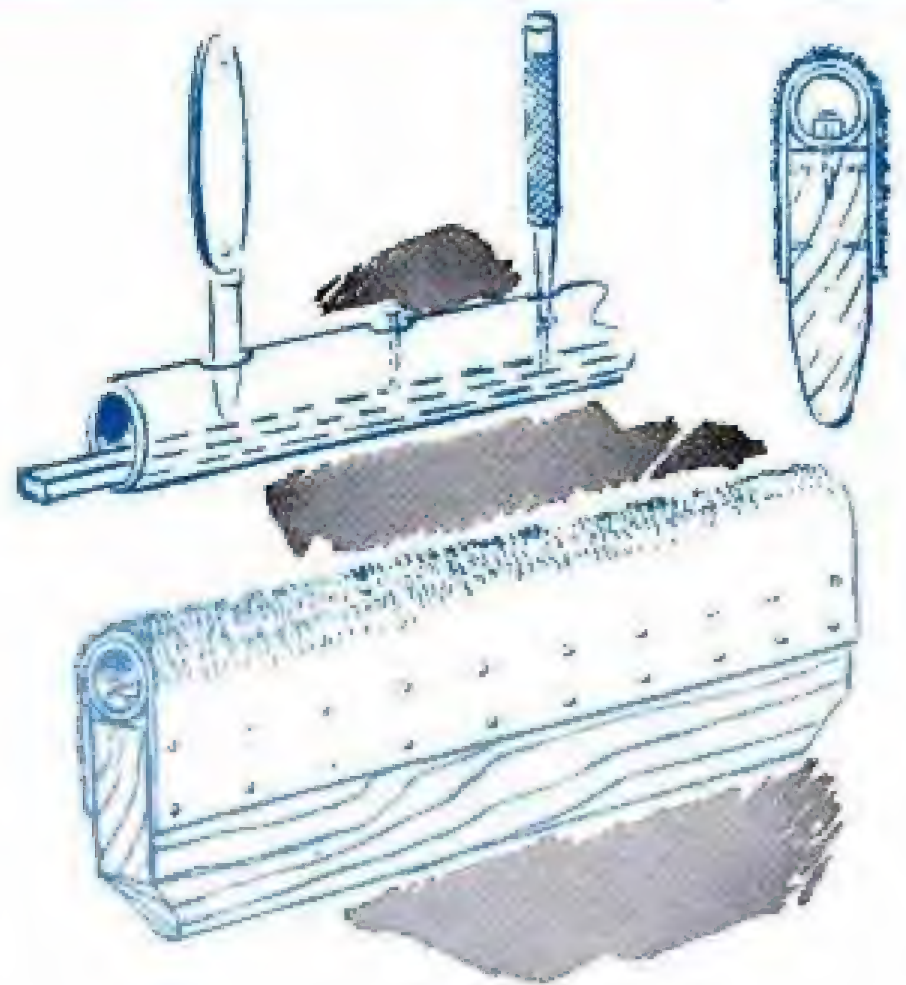
# Solving Home Problems



WAX PAPER protects shelf paper where syrup, salad oils, etc., are stored and eliminates need for replacing paper soiled by drippings



OLD ALARM CLOCK attached to toy wagon or tricycle can be set to ring at whatever time child is to return from play away from home. Ideal for child as yet unable to read time

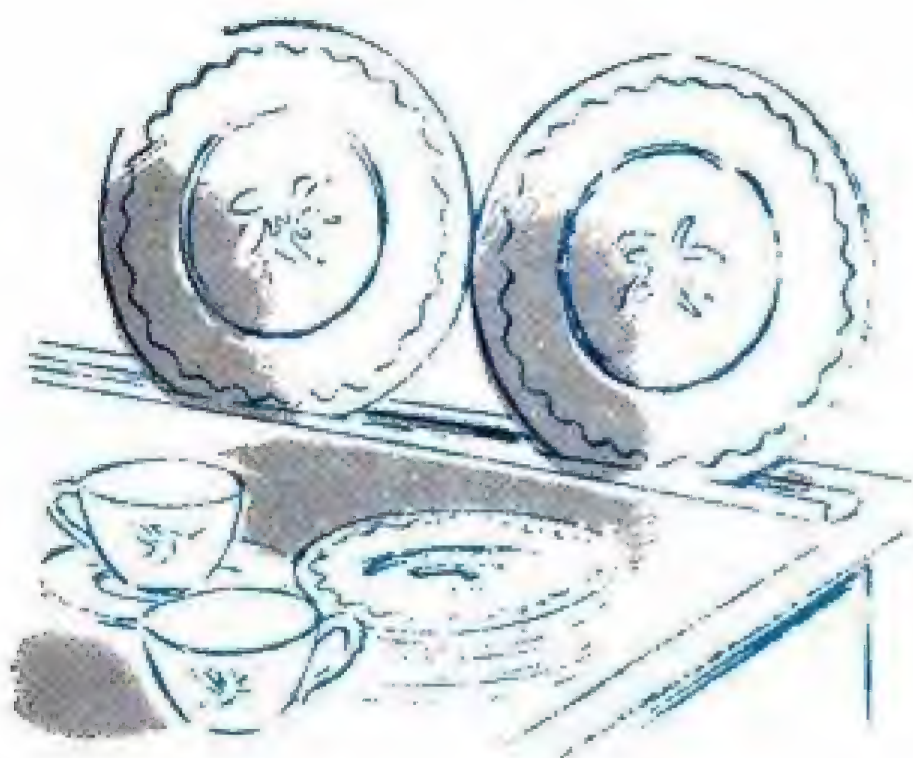


PAPERHANGER'S "BRUSH" can be improvised from board having length of hose nailed to one edge over which strip of discarded rug is tacked. Rug preferably should have long nap



PAINTBRUSH BRISTLES won't become misshapen when left in cleaner if brush is held by spring-type clothespin rested on can rim





**PLATE RAILS** for cupboard shelves can be provided from sections of flat curtain rods by cutting off the curved ends and tacking the rods to shelves with the open sides up



**INEXPENSIVE VEGETABLE GRATER** reinforced at one end with wooden handle will make quick work of shredding laundry soap and paraffin



**SMALL BLACKBOARD** mounted inside door of cabinet provides handy kitchen reminder that can be stored out of sight when not in use



**NOTE FOR MILKMAN** won't fall in bottle if slits are cut in paper from opposite sides almost to the center so that the upper portion forms tabs that rest on rim of bottle



**SMALL C-CLAMP** is ideal for unscrewing caps that stick on jars and small bottles. Too much pressure, however, may cause cap to bind, or possibly break neck of container



**PLASTIC PLACE MAT** beneath dresser scarf protects finish on dresser top from liquid cosmetics that might spill and cause stains

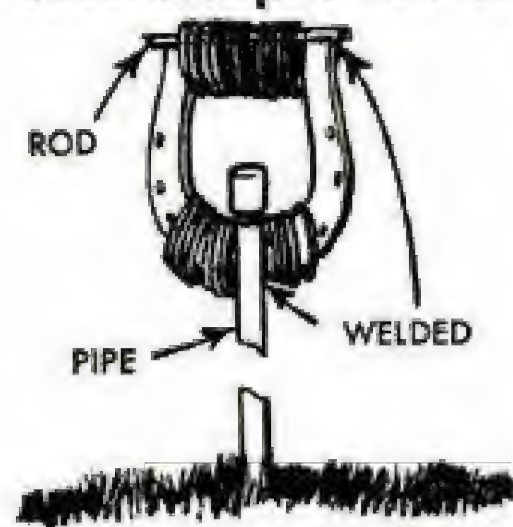


## Grass Seeder Made From Can Assures Even Distribution



To assure even distribution of grass seed when seeding parts of his lawn, one homeowner uses a giant "shaker" made from a large can having a press-fit cover. The first step in preparing the can is to place the cover inside up on a round block and punch slits with a hammer and cold chisel. The slits should be about 1 in. long and spaced an inch apart. Next, holes are punched in the center of the cover and the bottom of the can to take a  $\frac{3}{16}$ -in. bolt which, together with a wing nut, is used to secure it in place. Hi Sibley, Nuevo, Calif.

## Scorekeeper for Horseshoe Court



An unusual scorekeeping device for horseshoe games can be made by slipping harness rings over a horseshoe and welding a rod across the heel of the shoe to keep the rings in place. The shoe is welded to a steel stake for anchoring in the ground. One scorer is used at each end of the court and the score recorded by flipping the rings stored on the rod to the lower end of the shoe on either side of the stake.

## Aluminum Foil Lines Camping Pans

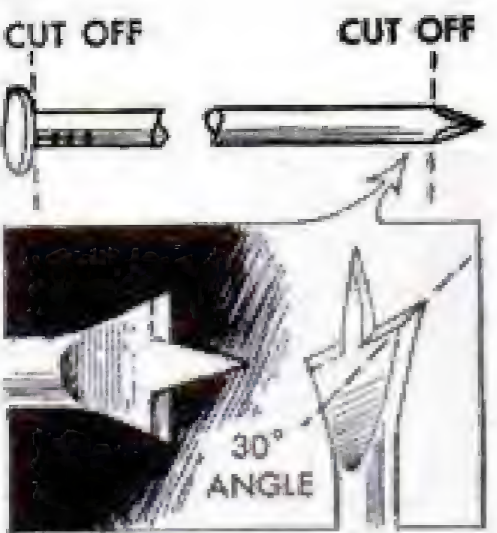
Aluminum foil, used to line skillets and baking pans on a camping trip, will cut down the cleanup work after a meal. To line the pans in this manner without puncturing holes in the foil, first shape the foil around

the outside of the utensil to be used, then place it inside and shape again.

John Krill, North Lima, Ohio.

## Improvised Drill Bit

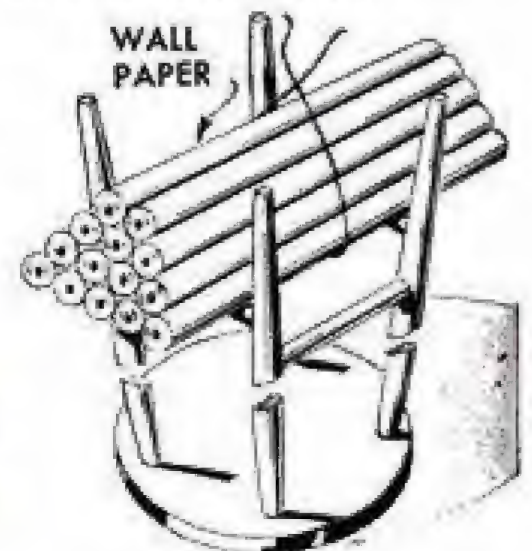
A small drill bit for use in soft wood can be made from a nail. The head and point are cut off and one end flattened to the desired width. This end then is filed to produce a spur point and cutting jaws, the latter being filed at angles of 30 deg. A drill of this type is for emergency use only, as it will dull rapidly.



Ed Packer, Chicago.

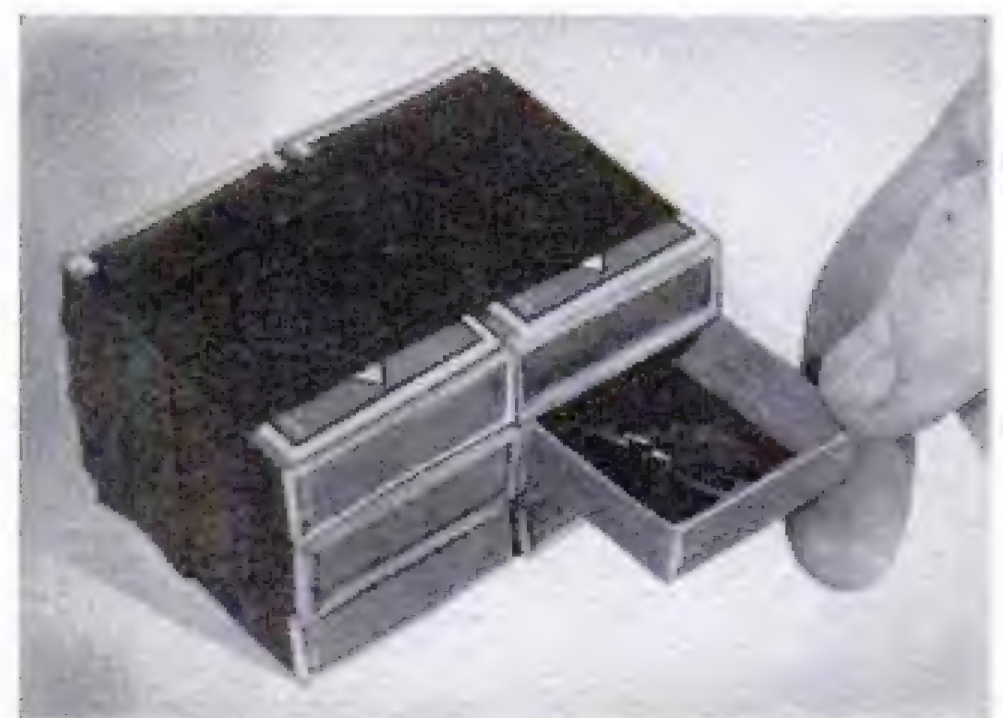
## Wallpaper Rolls Tied Easily When Placed on Inverted Stool

When tying rolls of wallpaper into bundles, use an inverted stool as a rack to hold the rolls. Also, use of the rack will lessen chances of the rolls being damaged when wallpapering rooms.



## Matchboxes Provide "Cabinet" To Hold Artist's Supplies

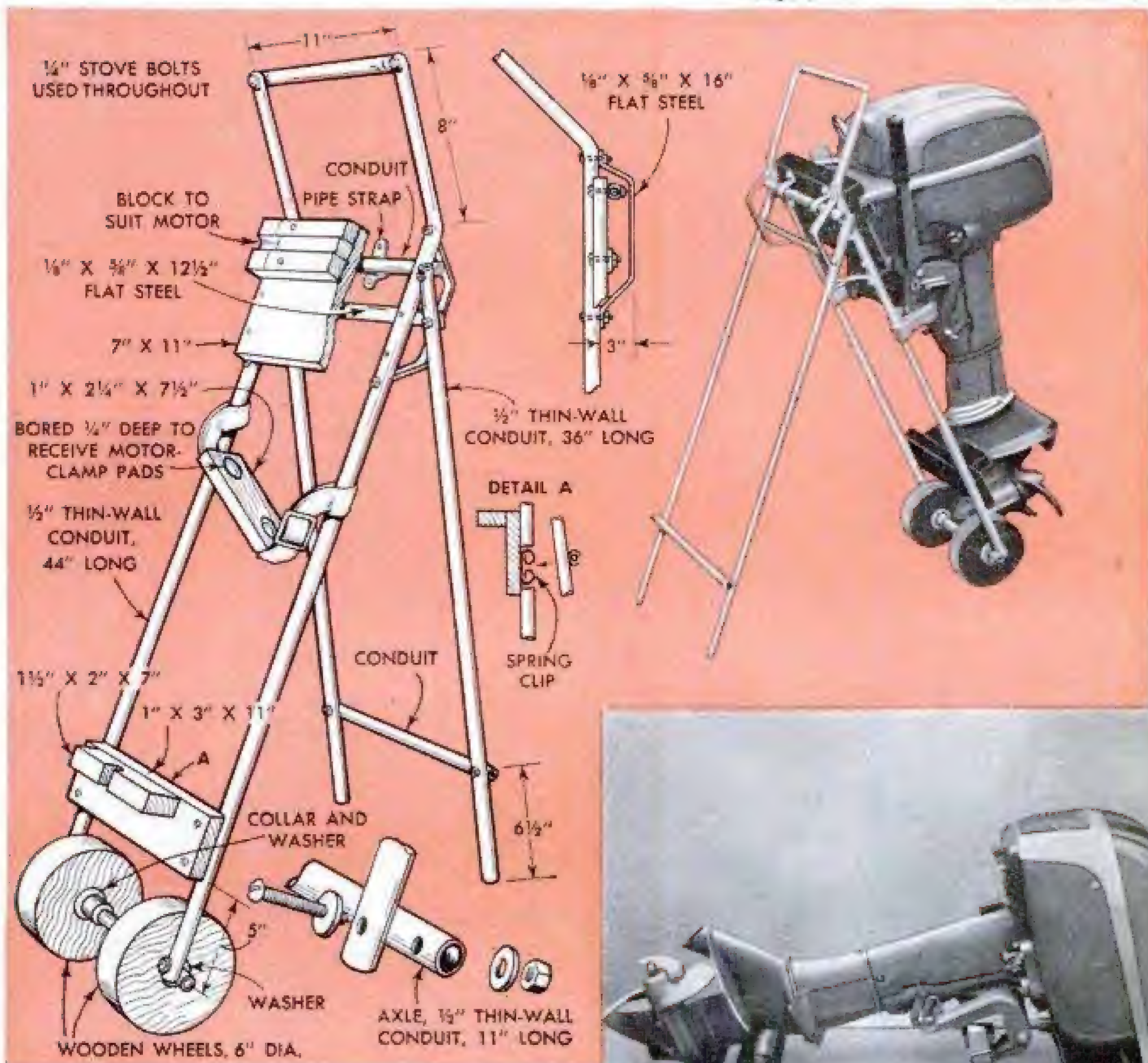
One amateur artist finds that a miniature "cabinet" made by binding several matchboxes together as shown is useful for storing pen points, thumbtacks, razor blades, etc. The boxes may be either glued together or bound with friction or adhesive tape. If desired, the ends of the "drawers" may be labeled to identify the contents.





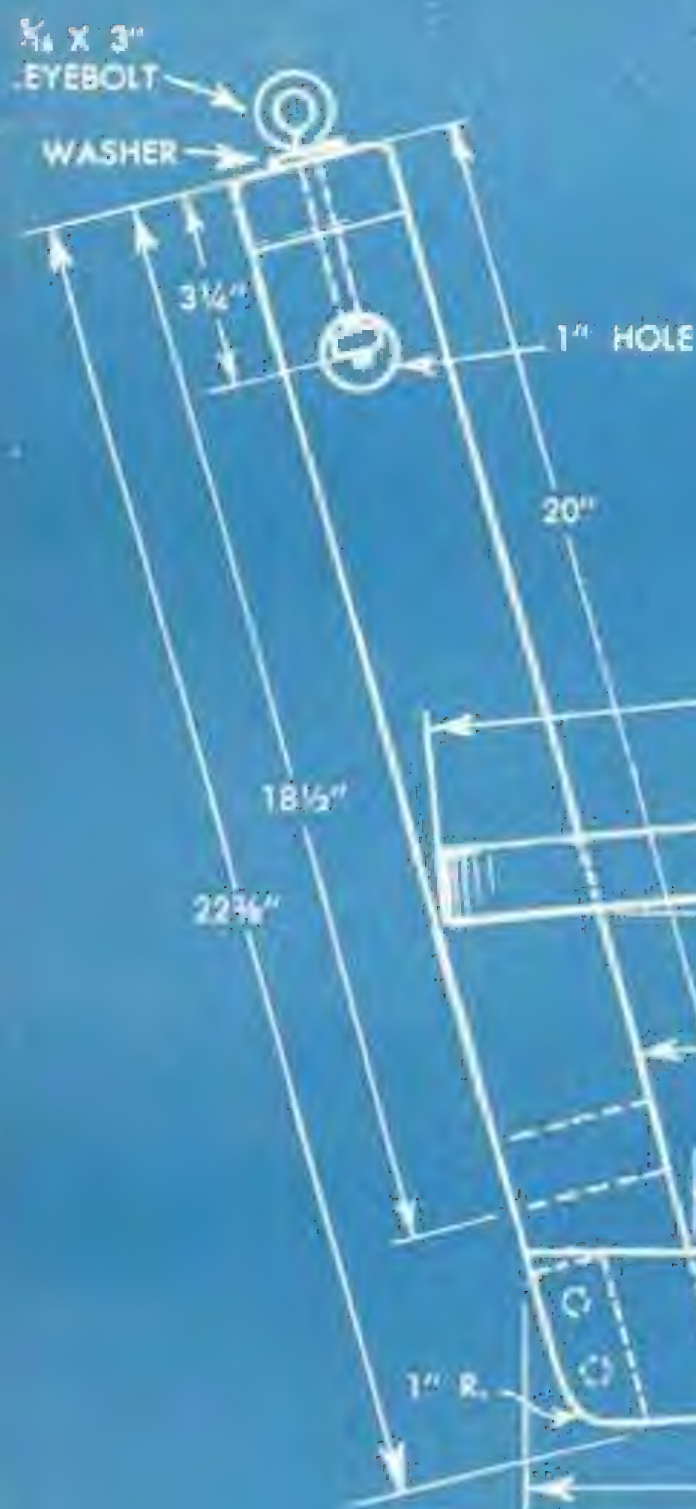
# A Cart for Your OUTBOARD MOTOR

LIGHTWEIGHT and easy to handle, this outboard-motor cart not only simplifies stowing the motor in the trunk or back seat of the car and carrying it to the boat, but also serves as a handy storage rack when the motor is not being used. The cart frame is made of thin-wall conduit, as detailed below, and fitted with a pair of wooden or semi-pneumatic wheels. One section of the frame swings outward to form legs when using the cart as a vertical motor stand. This section is hinged to the upper motor block with two pipe straps. The flat-steel legs bolted to the main frame serve as stops for the leg section while a spring clip fastened to the lower motor block holds the stand closed. Canvas belting is cemented to the wooden mounting blocks to prevent marring the motor. Dimensions given are for a 10-hp. motor and may be varied to suit.

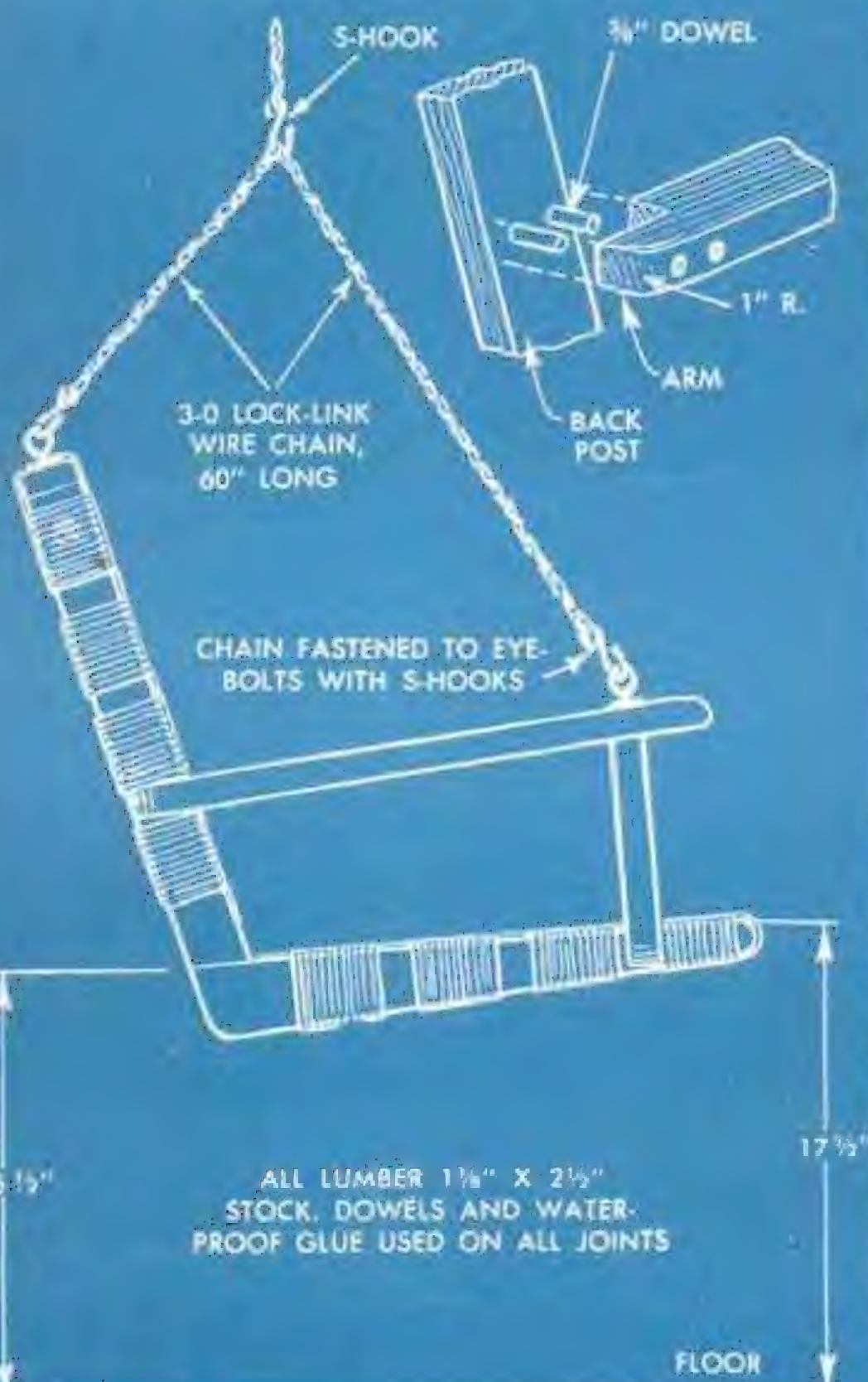




# PLAN of the MONTH...



Designed by John Bergen, this neat-appearing, comfortable porch swing features a seat and back of eye-catching decorative webbing



*WTM 255*

The porch-swing frame is made up of clear white pine or redwood; all the joints are doweled and glued. The rear corner joints are half-lapped and the arm members are notched to fit around the seat rails and back posts. Note in the details how the eyebolts for hanging the swing are mounted in the back and arm, the wooden members being drilled to permit inserting the nuts. After the swing frame has been finished, cotton or plastic webbing, 3 in. wide, is interwoven between the rails of both the seat and the back frames. Hang the swing from a pair of ceiling hooks as in the lower left-hand detail, with lengths of chain.

## BILL OF MATERIALS

### Clear white pine or redwood

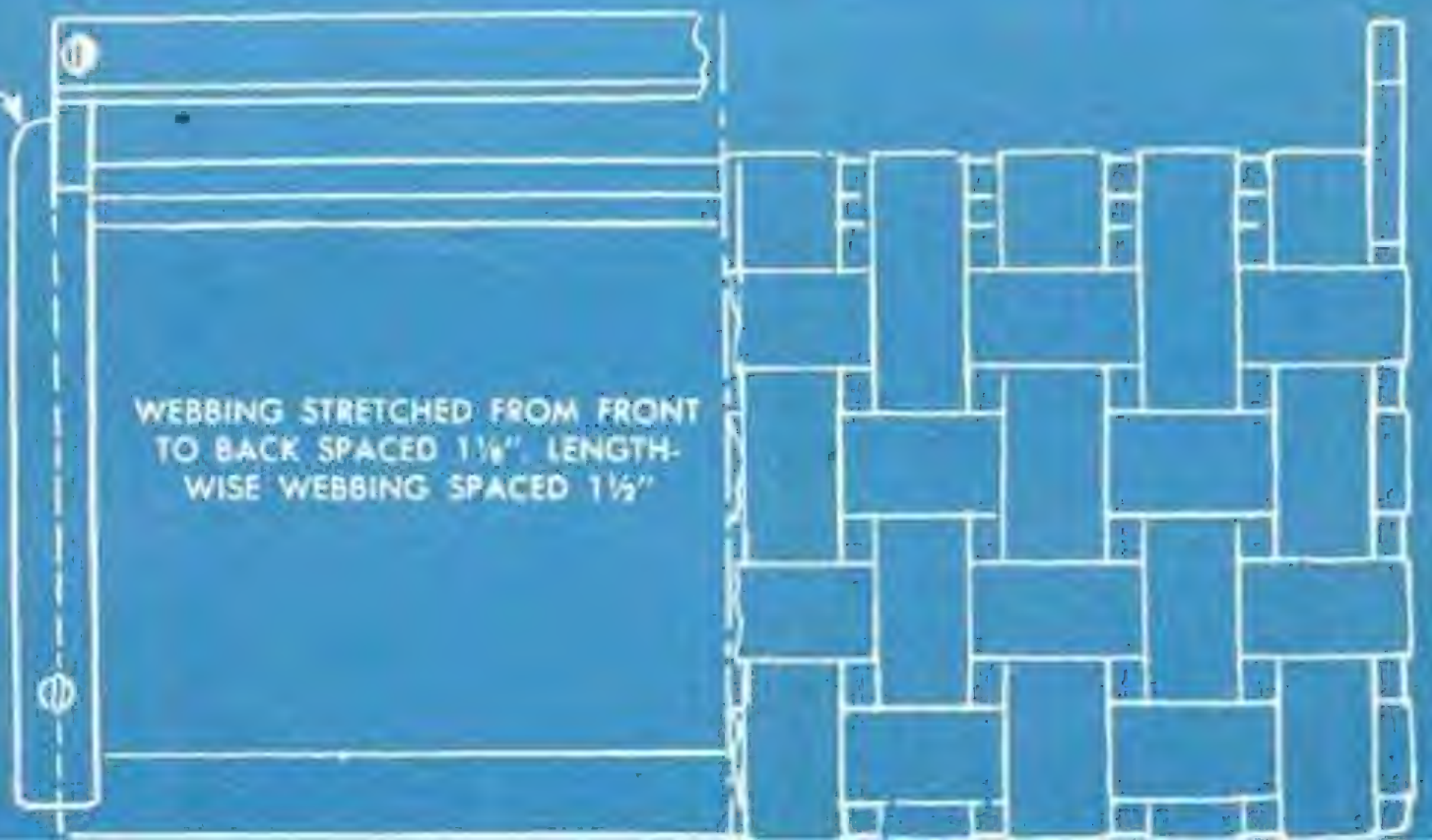
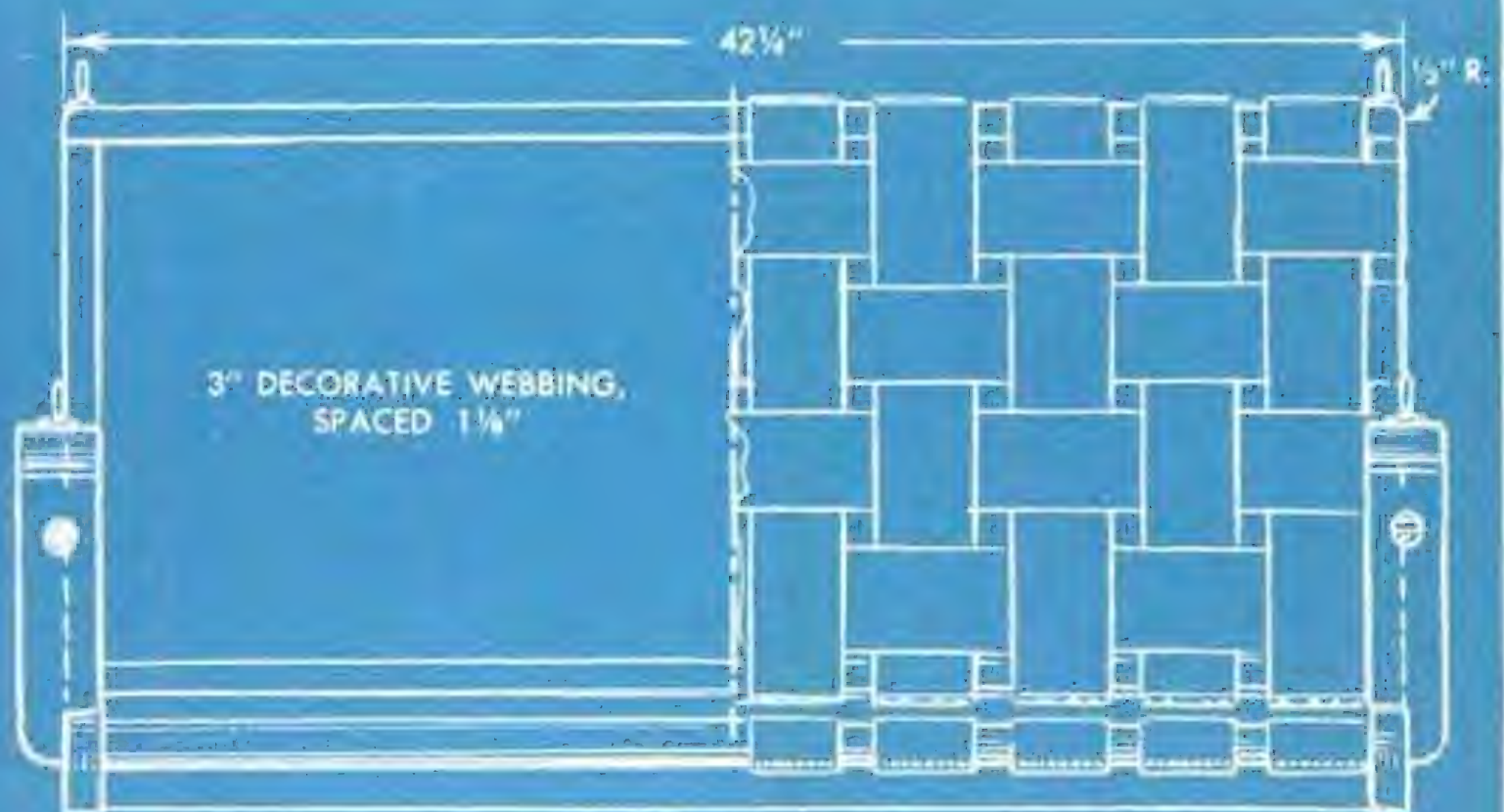
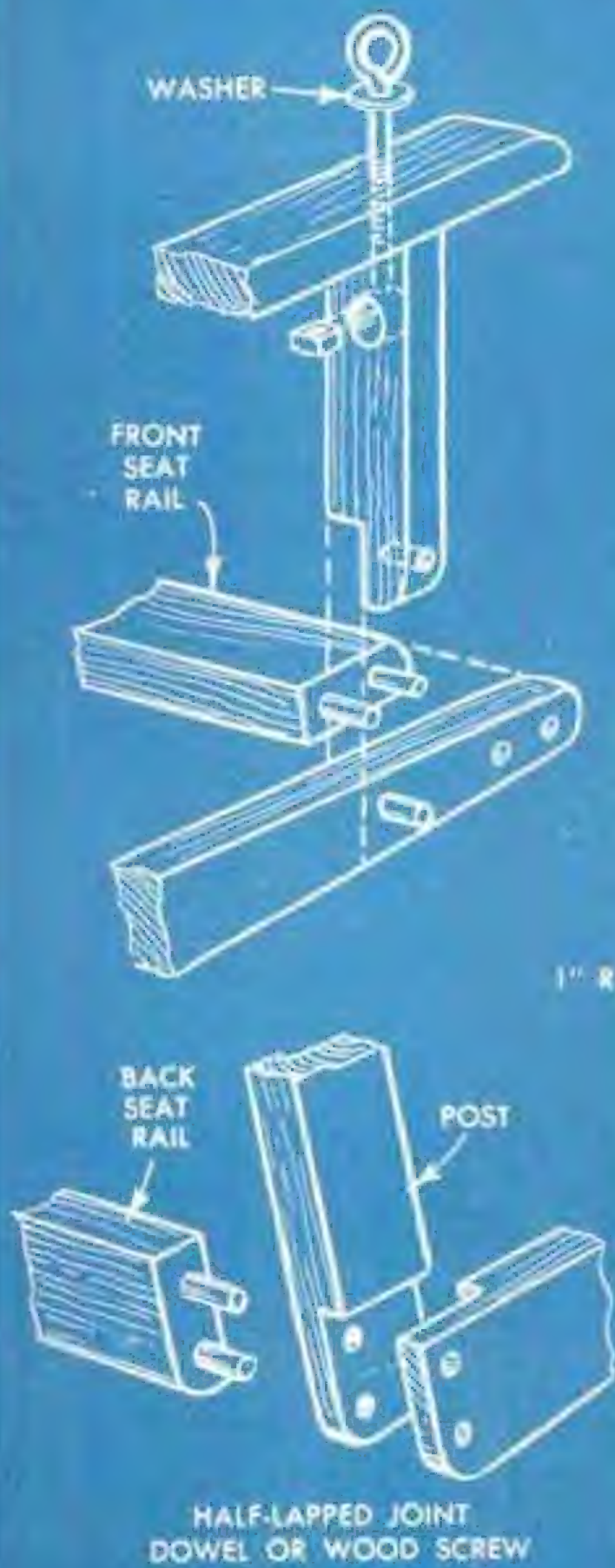
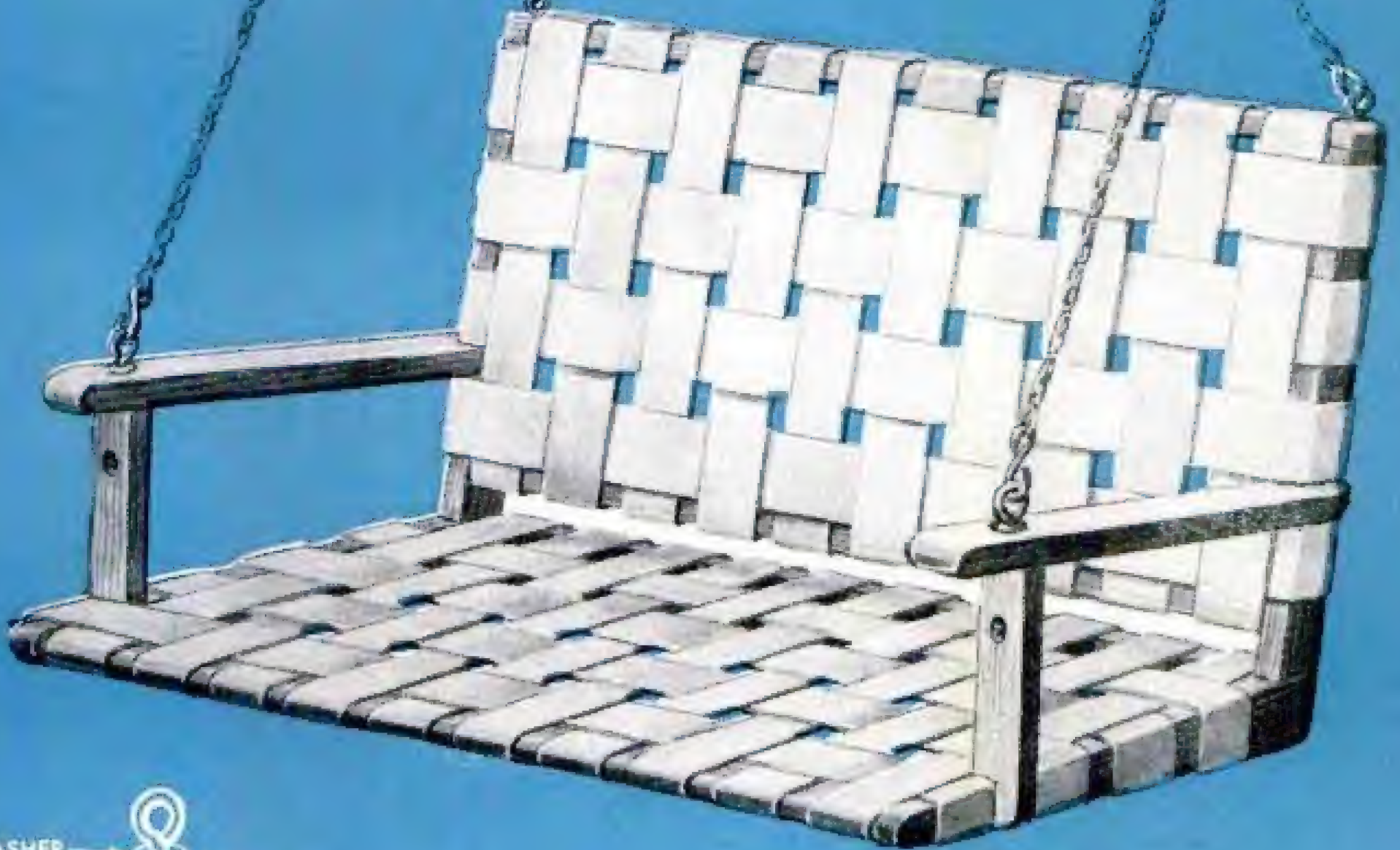
- 3 pcs.—1 1/8" x 2 1/2" x 40"—Seat and lower back rails
- 1 pc.—1 1/8" x 2 1/2" x 42 1/2"—Top back rail
- 2 pcs.—1 1/8" x 2 1/2" x 22 3/8"—Back posts
- 2 pcs.—1 1/8" x 2 1/2" x 21 1/8"—Side seat rails
- 2 pcs.—1 1/8" x 2 1/2" x 8-7/16"—Arm stumps
- 2 pcs.—1 1/8" x 2 1/2" x 21 3/4"—Arm boards

### Miscellaneous

- 4—5/16" x 3" eyebolts
- 4—3/8" washers
- 6—S-hooks
- 2—ceiling hooks
- 2—60" lengths of 3-0 lock-link wire chain, plus enough chain to suspend swing from ceiling



# Porch Swing



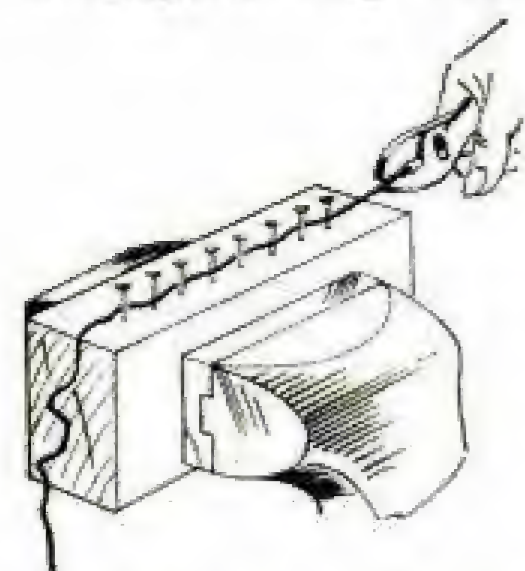


## Collar From Strip of Fencing Provides Tree Guard



To protect his trees from cats and squirrels, one homeowner stapled a collar of poultry wire around each trunk, several feet above the ground. The lower ends of the vertical wires were bent at an angle from the trunk, as in the illustration, to serve as a barrier, discouraging the most venturesome animals from climbing.

## Straightening Small-Gauge Wire



Wire of small gauge that has become kinked can be straightened by pulling it through a row of nails driven into a 2-in. wooden block. The nails are spaced about  $\frac{3}{4}$  in. apart and are driven in a straight line. After the block is clamped in a bench vise, the wire is threaded between the nails as shown, and drawn through under steady pressure.

## Cleaning Plastic Wall Tile

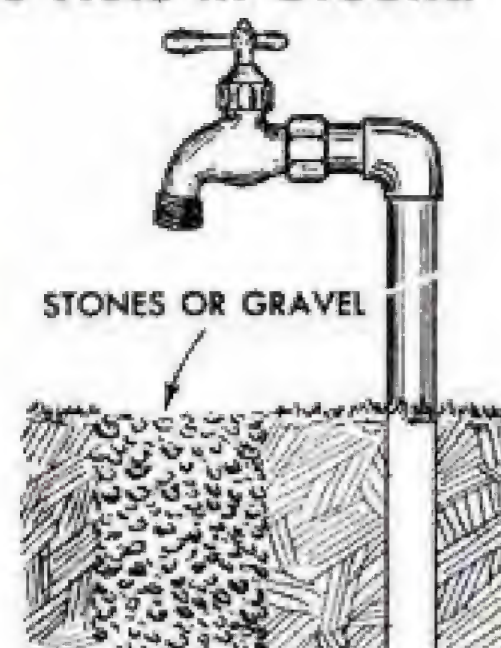
Dried paint and varnish can be removed from plastic tile with a solution consisting of pure gum turpentine, 1 part, and rubbing alcohol, 3 parts. Do not use turpentine substitutes in this formula, as they may damage the tile. The slight dulling of the tile resulting from this treatment can be eliminated by polishing the tile for a moment or two with a thick paste of powdered chalk and water and then wiping with a clean dry cloth. Plastic tile which has been dam-

aged by solvents such as nail-polish remover and paint remover also can be restored. In such cases, the damaged area is rubbed briskly with a paste of fine or medium pumice and water. When the mark is removed, the tile must be polished again with powdered-chalk paste. This same treatment can also be used where the tile has been scratched or scarred.

Fred D. Johnson, Cliffcrest, Ont., Can.

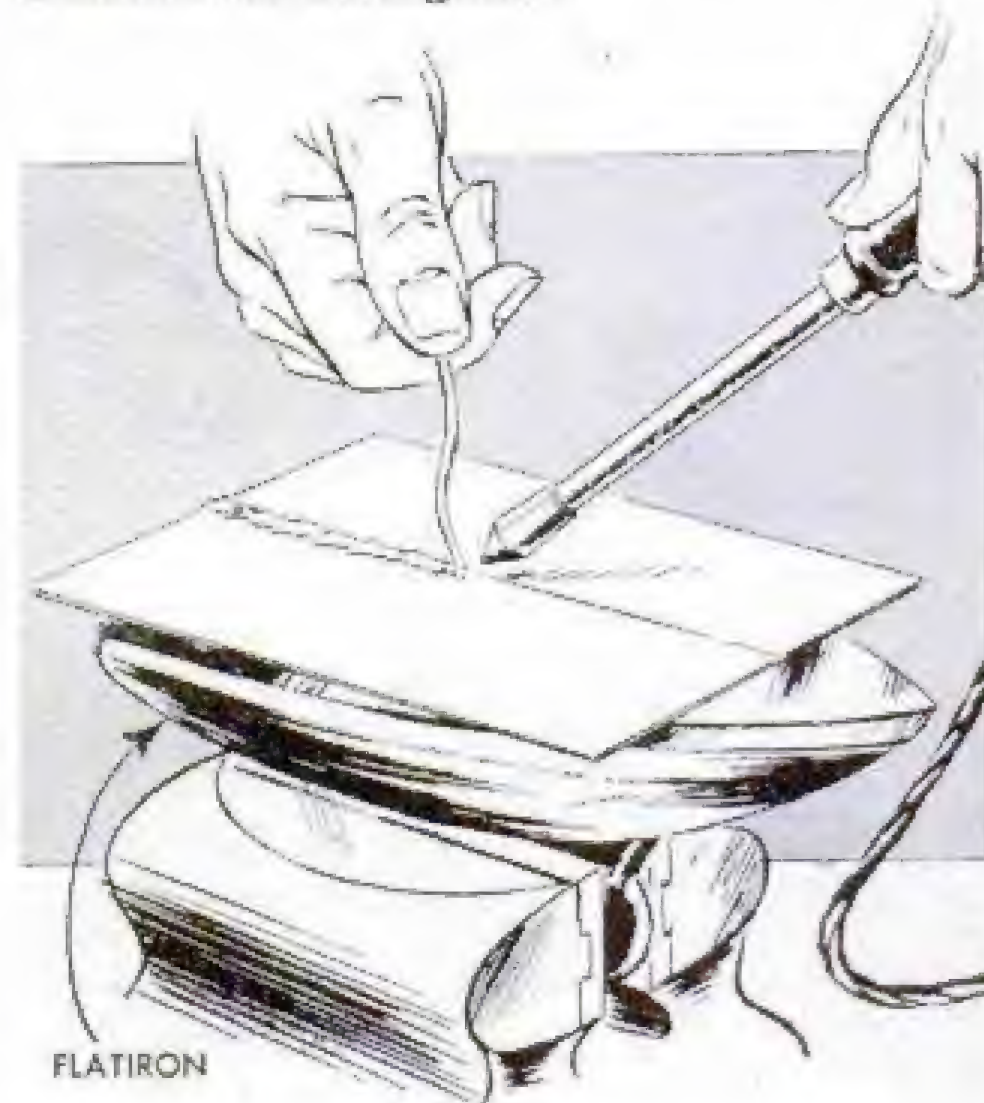
## Faucet Drains Into Hole in Ground

To prevent the formation of a mudhole around his outdoor faucet, one farmer dug a hole under the spout and filled it with gravel. With ordinary usage, waste water falling into the hole will drain off through the gravel.



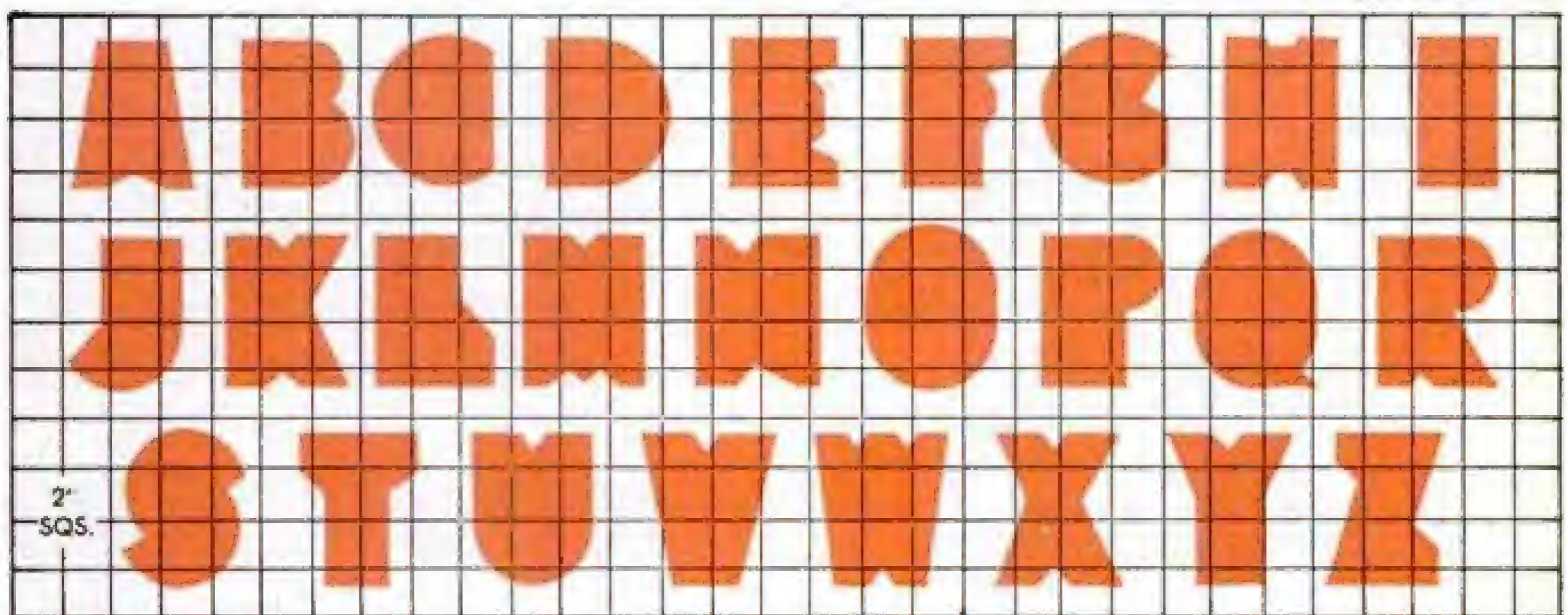
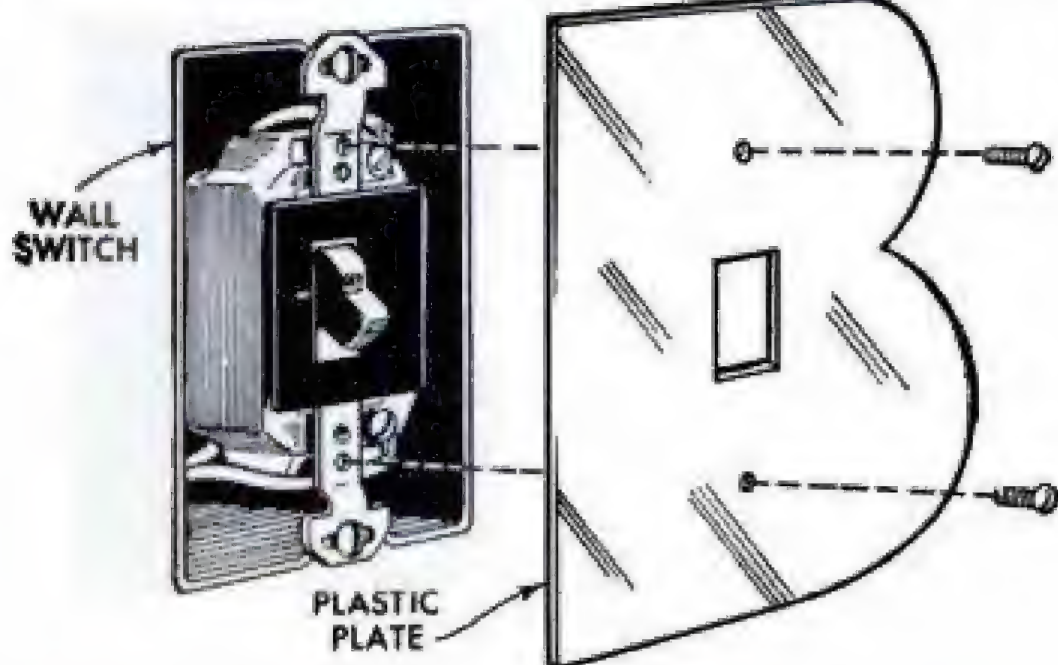
## Flatiron Preheats Large Work For Soldering With Small Iron

When you are faced with a soldering job that is beyond the capacity of your soldering iron, the difficulty can be overcome by using an electric flatiron to preheat the work. Just clamp the flatiron in a vise with the sole plate up, lay the work on top as shown and plug in the cord. As a result of this preliminary heating, the work does not dissipate heat from the soldering iron as readily as it would ordinarily, thus making it possible for the job to be done with a smaller soldering iron.



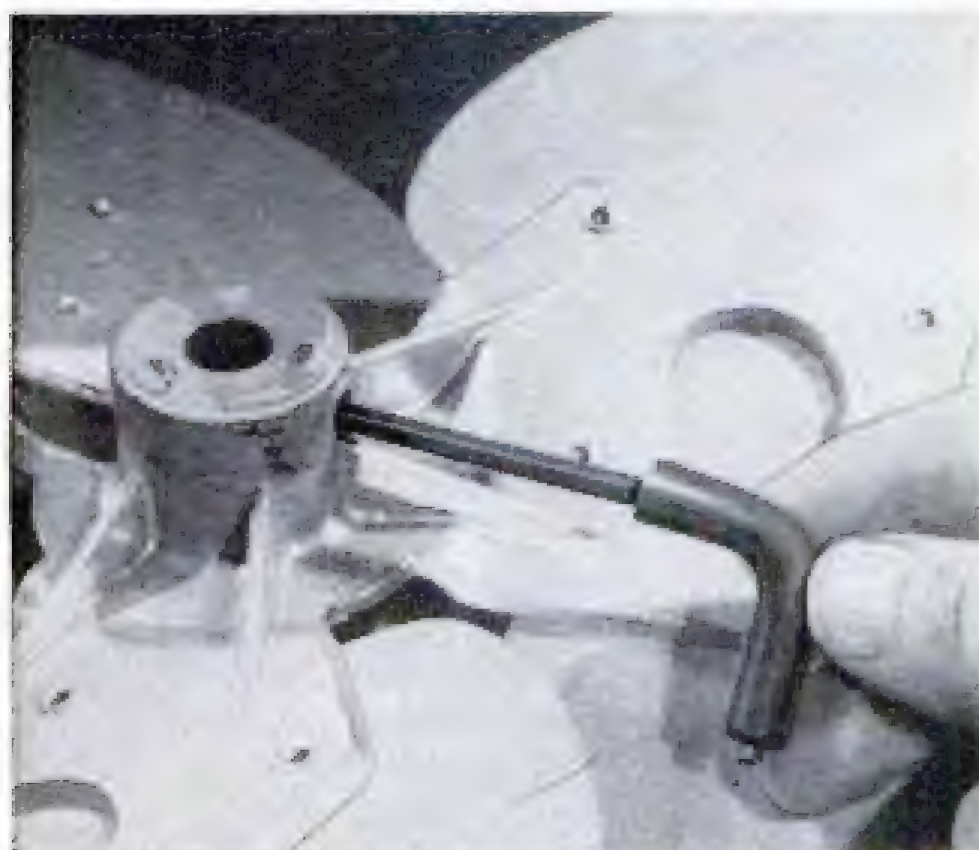


# Personalized SWITCH PLATES



You can get away from the old standard ideas in decorating a child's bedroom or playroom by adding these unusual personalized switch plates, which are big, colorful initials cut from 1/16-in. sheet plastic. All letters can be traced on 5 x 6-in. opaque colored sheets, except "I", which requires a 3½ x 6-in. piece, using the pattern pictured above. The plastic is cut easily with a coping or jig saw, interior cuts being made by first drilling a hole in which to insert the saw blade and then following the pattern. The edges are filed and then finished with sandpaper, steel wool or a buffing wheel.—L. W. Shapiro, Chicago

## Rubber Hose on Setscrew Wrench Provides Cushioned Handle

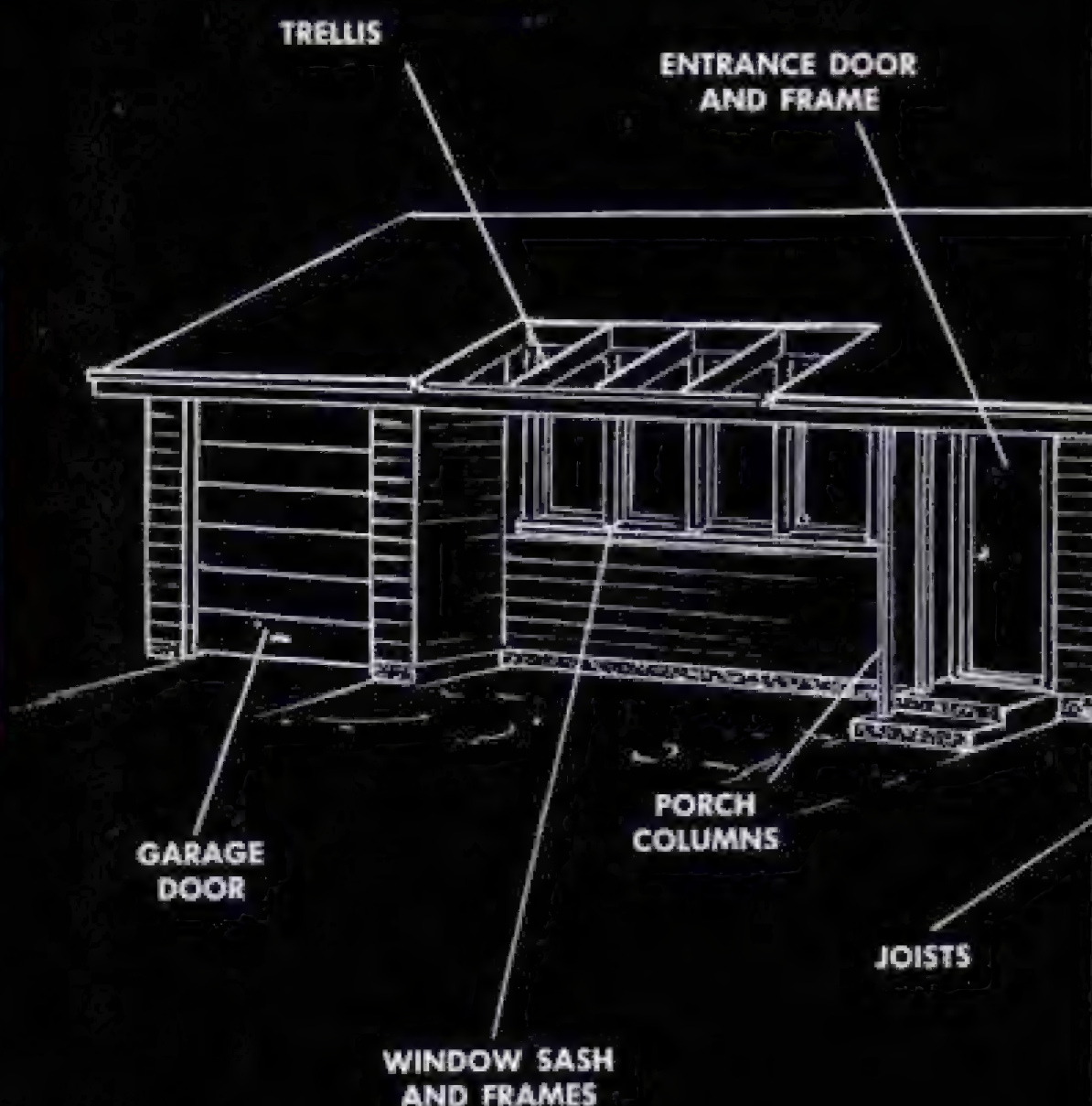
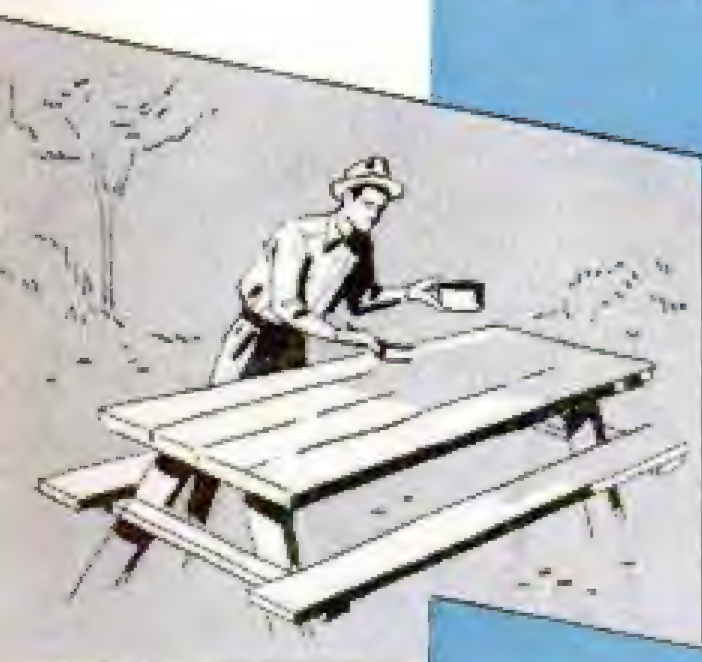
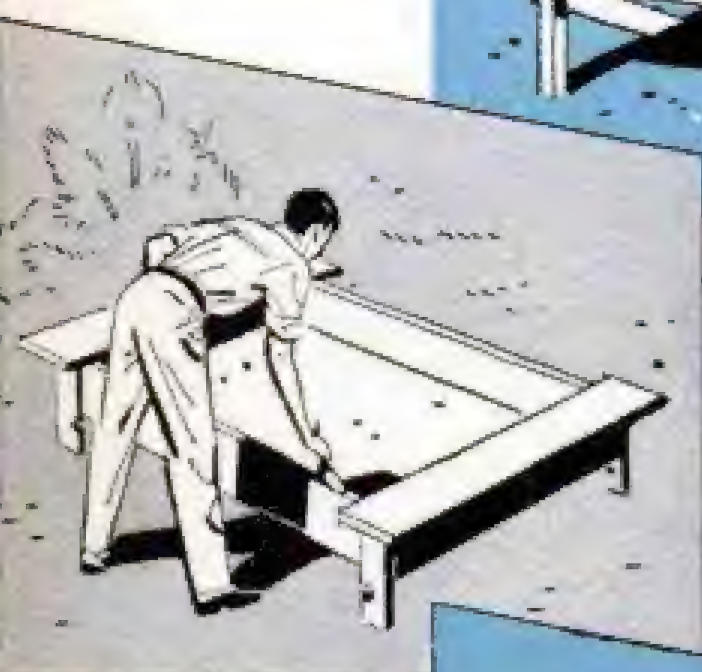


To cushion the fingers from the edges of a setscrew wrench, slip a short length of rubber tubing over one end as illustrated. The tubing should be loose enough so it can be slid around the bend for use at either end.—Ken Murray, Colon, Mich.

## Cement for Patching Concrete

A waterproof cement for patching or coating cellar walls can be made by mixing portland cement and sour milk to form a paste. Do not use homogenized milk. For patching cracks, use a thick paste of the mixture, and for coating walls, thin it to a brushing consistency.—Edward G. Wid-dis, San Francisco, Calif.





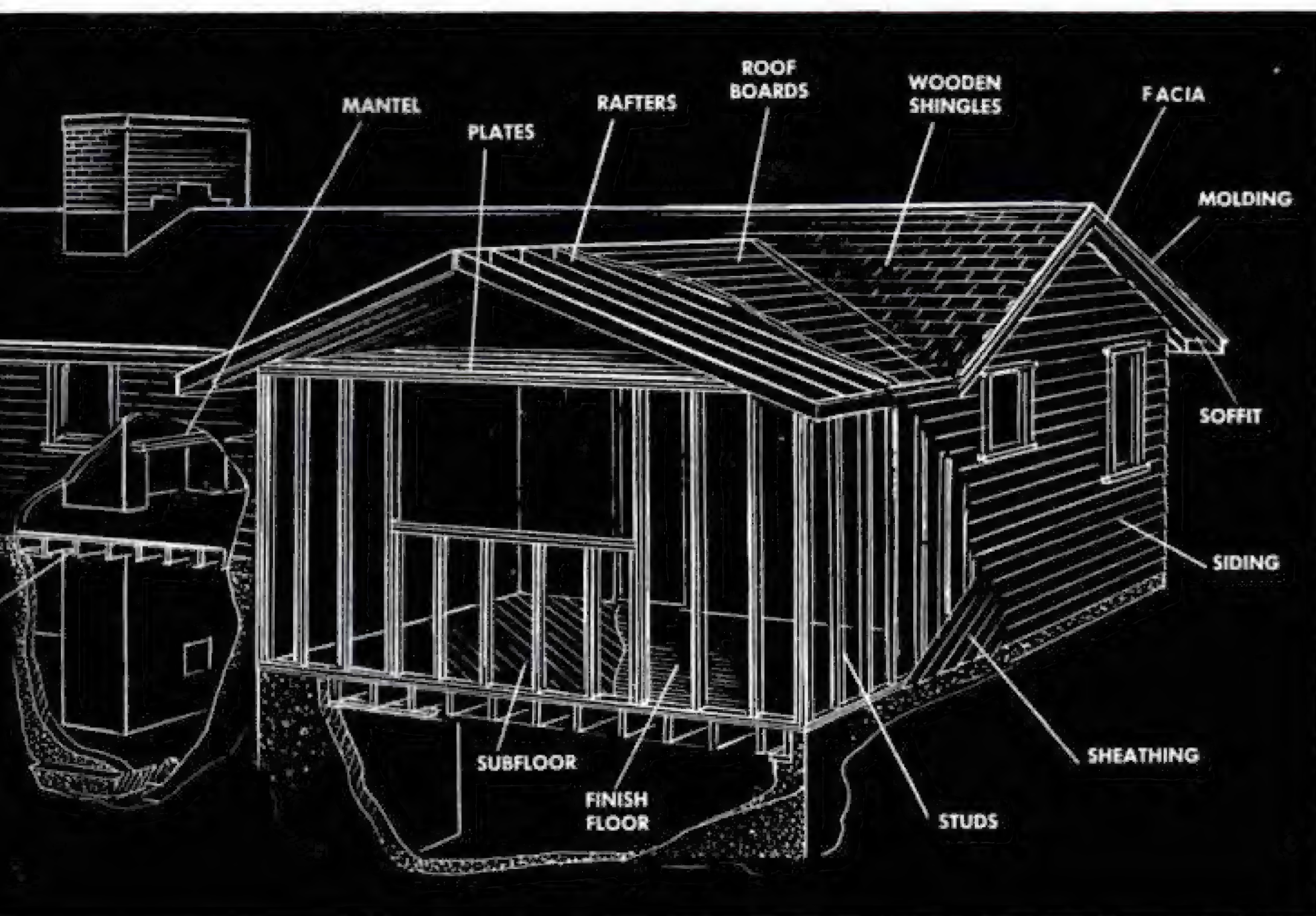
# BEATING WOOD ROT

Wood is the universal building material, but when left exposed to the weather or in constant contact with the ground, in time it rots and crumbles. Chemical preservation now makes it possible for the homeowner to arrest decay and make wood unsavory dish for hungry termites

**N**O DOUBT you'll give that new lawn chair, picnic table, sandbox or other product of your basement workshop a couple of coats of paint and feel it's sufficient to preserve and protect it from wood rot. Actually, paint offers little or no protection against wood rot and wood-eating insects for the simple reason that paint, in itself, is not a wood preservative.

There was a time when creosote was the only type of wood preservative available. Now, a comparatively new liquid preservative, called pentachlorophenol, or penta for short, has been made available to the homeowner and can be applied easily to new wood by dipping, brushing or spraying. Unlike creosote, which has a lasting objectionable odor and cannot be painted over, penta





# TO THE PUNCH By Wayne C. Leckey

is an odorless, water-clear, nonstaining solution that leaves a clean, paintable surface. Used for years in preserving railroad ties, utility poles, car decking and bridge planking, this new, highly penetrating chemical preservative has been thoroughly tested by industry. Recently the makers of windows and doors and other millwork have begun to use treated wood to insure dimensional stability and high toxicity to rot, termites and other wood destroyers. All of which means longer life, more positive protection to these parts of your home.

**Penta and new construction:** If you are planning to build a new home, by all means plan to use treated lumber for such vulnerable structural members as the sills, studs, joists and other parts that are subjected to a great degree of moisture, fungus growth or insect attack. Preserving these vital parts as well as all the other members that go into the building of a house is one of the best insurance investments you can make. Ordinarily, the cost adds only about two percent to the total investment.

As a homeowner you'll be more concerned with treating the lumber that you may be using in a new porch, garage, fence

or a pair of steps. Here, if you are unable to buy preservative-treated lumber in your locality, you can get the jump on the ravages of moisture and insects by painting the wood yourself with a good preservative.

**Choice of preservatives:** There are two types of penta-preservative solutions available which are packaged in quart, gallon, 5-gal. and 55-gal. amounts. The gallon size retails for around \$3 and may be purchased at most hardware and lumber dealers. One type is labeled water-repellent and paintable and is recommended for flooring, siding, studs, lawn furniture, trellises, fences and the like. Applied to such millwork products as doors, windows and interior woodwork, the preservative not only prolongs their life but also provides freedom from warping, sticking, swelling and shrinking. Building authorities now recommend it as a prime coat before painting.

Where the wood is not to be painted, a lower-cost general-purpose solution is available. This comes in concentrated form and is diluted, 1 part penta and 10 parts diesel fuel, kerosene or No. 2 fuel oil. In these proportions, one gal. of wood preservative makes 11 gal. of solution. Its low cost





Left, improvised tank of oil drums takes long lengths of siding and lumber. Complete penetration of siding requires approximately three minutes



Above, three gal. of preservative in oil-drum tank will treat about six 4-in. posts

Photos courtesy The Dow Chemical Co.



Below, sawed ends of treated lumber are re-treated to protect exposed end grain



makes it both practical and economical to treat large numbers of farm fence posts where a volume of solution is required. Rustic ornamental fences may be given a rich natural tone and preserved at the same time. The farmer will find that a spray application of the solution to the roosts, floor and walls of his poultry house will kill chicken mites on contact, and because of its low cost, the solution is particularly effective as a soil poison for subterranean control. Where termites are especially rampant in coastal regions and the South, the ground on the outside of the foundation wall is soaked with a diluted solution of general-purpose preservative. In houses without basements, but with crawl spaces beneath the floors,

the entire area is saturated with the solution. Since termites can enter the house only from the ground, such treatment keeps them away before they ever have a chance to get to the wood.

**Methods of application:** If you do your own treating, obviously the greatest penetration and protection are obtained by the immersion, or cold-soak, method. A suitable soaking trough for long lengths of lumber and siding can be improvised from several 55-gal. drums, as above, the drums being cut in half lengthwise, the ends removed and then welded end-to-end to form a trough. Construction lumber and posts to be used in the ground or in close contact with the soil should receive the soaking treatment. It is best to treat the wood after all sawing, planing and boring have been completed. If any



cutting is done after treatment, the exposed surfaces should be re-treated. Make sure that the wood is absolutely dry, for the drier it is the more preservative it will absorb and the more effective the treatment.

Where the immersion of wood is not practical, as in the case of existing structures, the preservative is flowed freely onto the surface of the wood, either with a brush or spray equipment. At least two applications are recommended, three being still better. If application is done by spray, use a low-pressure-type gun having a coarse nozzle. The important thing is to be sure the solution reaches thoroughly into cracks and crevices where moisture could collect. Don't be stingy with the preservative. Apply it generously—all that the wood will absorb. Since decay is likely to occur more rapidly at points of contact with the ground, use special care in covering such areas.

After treatment, let the material stand in a well-ventilated place until dry. This usually requires at least 48 hrs., the length of time depending particularly on the weather and the degree of humidity. When thoroughly dry, the wood may be painted in the usual manner. When applied by brush, 1 gal. of preservative will cover approximately 150 to 200 sq. ft. of surface. Where the soaking treatment is used, 5 to 10 gal. of solution are required per 1000 board feet of lumber.

**Prime targets for wood rot:** Rot-producing fungi breed under moist and humid conditions. Gutters left clogged with muck will soon rot the wooden trim and roof boards along the eaves and, therefore, the gutters should be cleaned periodically and coated with asphaltum paint. Stringers for porch steps also are vulnerable members, as is any stock that is below or at ground level. Lawn furniture, especially the legs, is subject to wood rot, as are a fence and its supporting posts. The lower ends of the supporting posts in your basement are prime targets for wood rot. Water used to scrub the floor is absorbed by the posts, wood rot sets in and soon the wood begins to crumble, resulting in cracks appearing in plastered walls due to settling of the structure by the rotting posts. Wooden window boxes, the bottom edge of your upward-acting garage door, corn cribs, watering troughs and grain bins are easy prey to wood rot.

**Caution:** In using pentachlorophenol solutions, avoid excessive inhalation of vapors and contact with skin. It is best to wear rubber gloves and observe precautions and handling instructions on can label. ★ ★ ★

Information courtesy The Dow Chemical Co. and Chapman Chemical Co.

⌚ Increased resistance in the steering assembly of an automobile sometimes is an indication the front brakes are dragging.



Above, preservative can be applied to an existing structure with portable sprayer. If desired, both stain and preservative may be applied at same time. Mask windows as preservative adheres to glass

Right, storm and window sash often are treated at mill before shipping to dealer. Homeowner can dip own by "rotating" frame in tank of penta

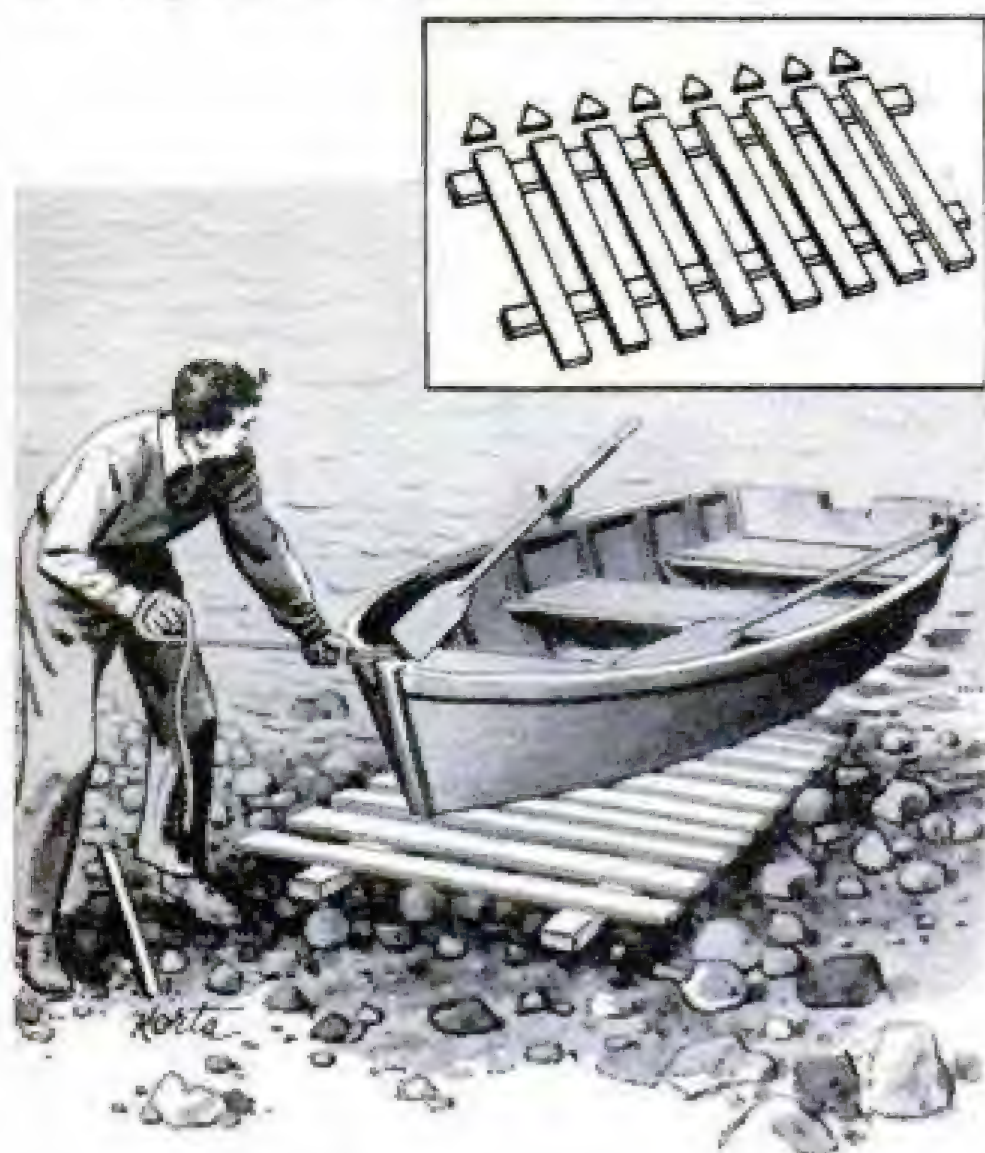


Below, prime target for wood rot is joint at window sill and casing. Apply preservative liberally with a brush or oil can



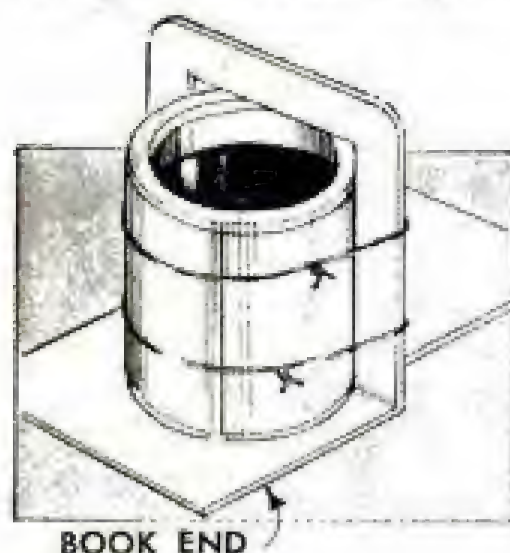


## Picket Fencing Used as Ramp When Beaching Small Boat



To prevent damage to his rowboat when beaching it on the rock-covered shore near his cottage, one sportsman uses a discarded section of picket fencing to provide a ramp. After sawing off the pointed ends of the pickets, he partly submerged one end of the section and drove stakes to anchor it in place.—Dick Godin, Lindenhurst, N. Y.

## Book-End "Feet" for Paint Can Help Prevent Upsetting



A can of paint is less likely to be tipped over accidentally if it is secured to a metal book end as shown. This can be done by using wire, heavy rubber bands or several turns of string. If a book end is un-

obtainable, a thin block of wood may be nailed upright to another similar to the book end and used in the same manner.

## Nylon Bristle on Tone Arm Cleans Phonograph Record

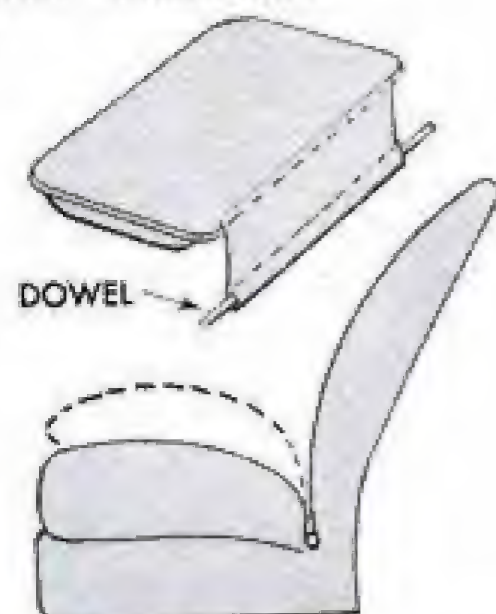
Attached with adhesive tape just ahead of the needle on the tone arm of a phonograph, a single bristle from a stiff-nylon toothbrush or hairbrush can be adjusted so it will dislodge any dust particles in the groove about to be played. This assures

eliminating any dust particles that possibly may have been missed by the soft-nylon brush on the tone arm with which many phonographs are equipped for this purpose.

C. M. Cole, New Orleans, La.

## Apron Secures Seat Cushion

Motorists who use a cushion on the front seat will find that a flap or apron sewed to one hem of the cushion and tucked down between the seat and the back will keep it firmly in place. If a more secure anchorage is required, the loose end of the flap can be hemmed to receive a dowel, which is then forced down into the seat crevice.



## Fish Kept Fresh in Carton Lined With Aluminum Foil

When lined with aluminum foil, a corrugated-cardboard carton will provide an excellent "refrigerator" for bringing home extra fish and game caught or bagged during a vacation. Before packing, however, it should be cleaned, dried and either chilled thoroughly or frozen. This can be done at an icehouse or frozen-food locker in the vicinity of your camp. Then the fish or meat is wrapped loosely in several layers of the foil, which may be purchased at most grocery stores. Next, one or two pieces of Dry



Ice are wrapped in a piece of woolen cloth and packed with the meat. If Dry Ice is not available, two 5-lb. salt or sugar sacks can be filled with sawdust, soaked in water and then drained until they no longer drip, after which they are frozen. This may be done when locating an icehouse where the sacks may be left for freezing and picked up later. Do not use ordinary ice, however, because it will melt quickly and damage the box.



X667



WIM 255

**MAKE YOUR OWN**

# Surf Rod

*By Shep Shepherd*

Surf fishermen use sand spike to hold rod

**E**XPERIENCED SURF FISHERMEN say they like the feel of a natural-bamboo rod and that's why many make their own from a selected bamboo pole, or "Calcutta," as it is sometimes called. Preference in length may vary, but 13 to 15 ft. will fit nearly all requirements. When squidding from a wide beach or shoal, the longer rod is an aid in getting artificial lures into the deeper water beyond the breakers. Of course, the precise butt and tip lengths of the rod are determined to some extent by conditions and, for this reason, determining the rod length is largely a matter for the individual fisherman to decide for himself.

The first step in selecting the bamboo pole from which the rod is to be made is to hold it as in the lower photo above, and turn it slowly to locate the "spine," or point, where the pole takes a natural bend. Notch the butt so that you can locate this point later. Inspect each joint for defects and irregularities in







Start wrapping at butt with one color of cord. Add the second color 1 in. from butt and continue as pictured. It's essential to wrap tightly and uniformly



Tape reel seat only at center, leaving ends clear for the wrapping. Continue butt wrapping 6 to 8 in. above the reel seat. Use the same color, or colors



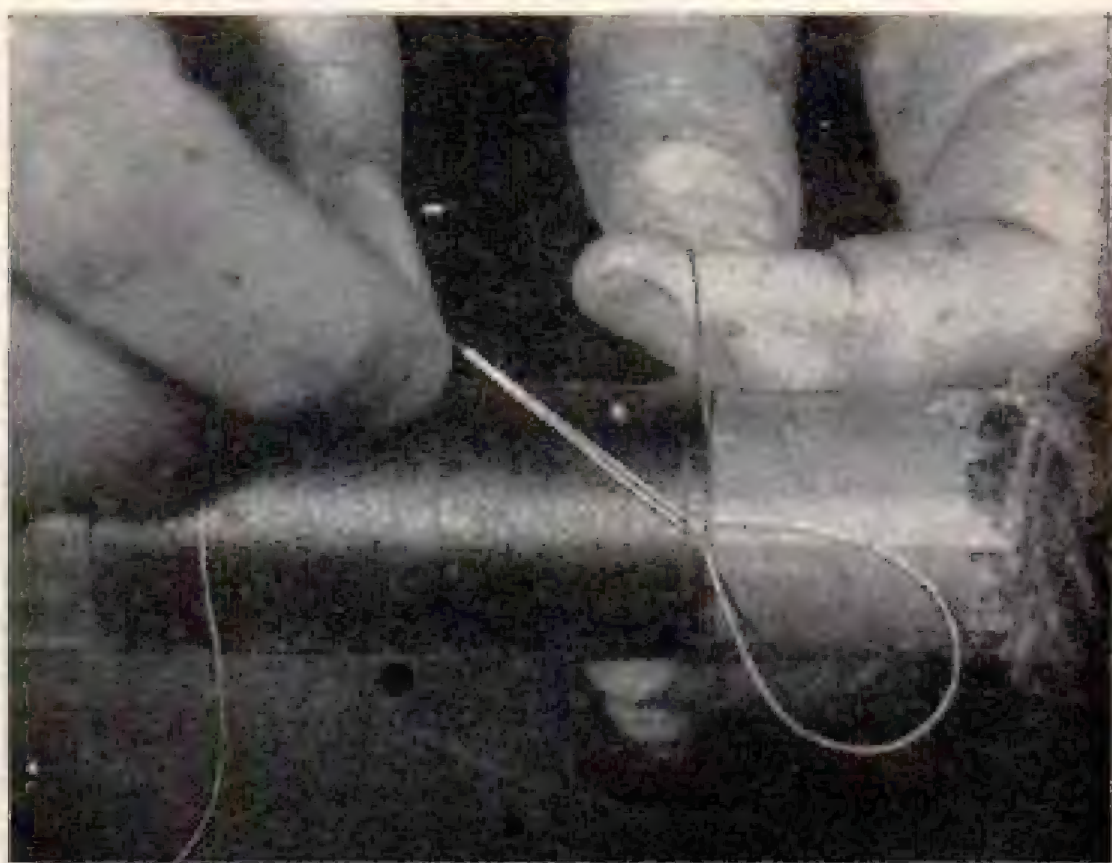
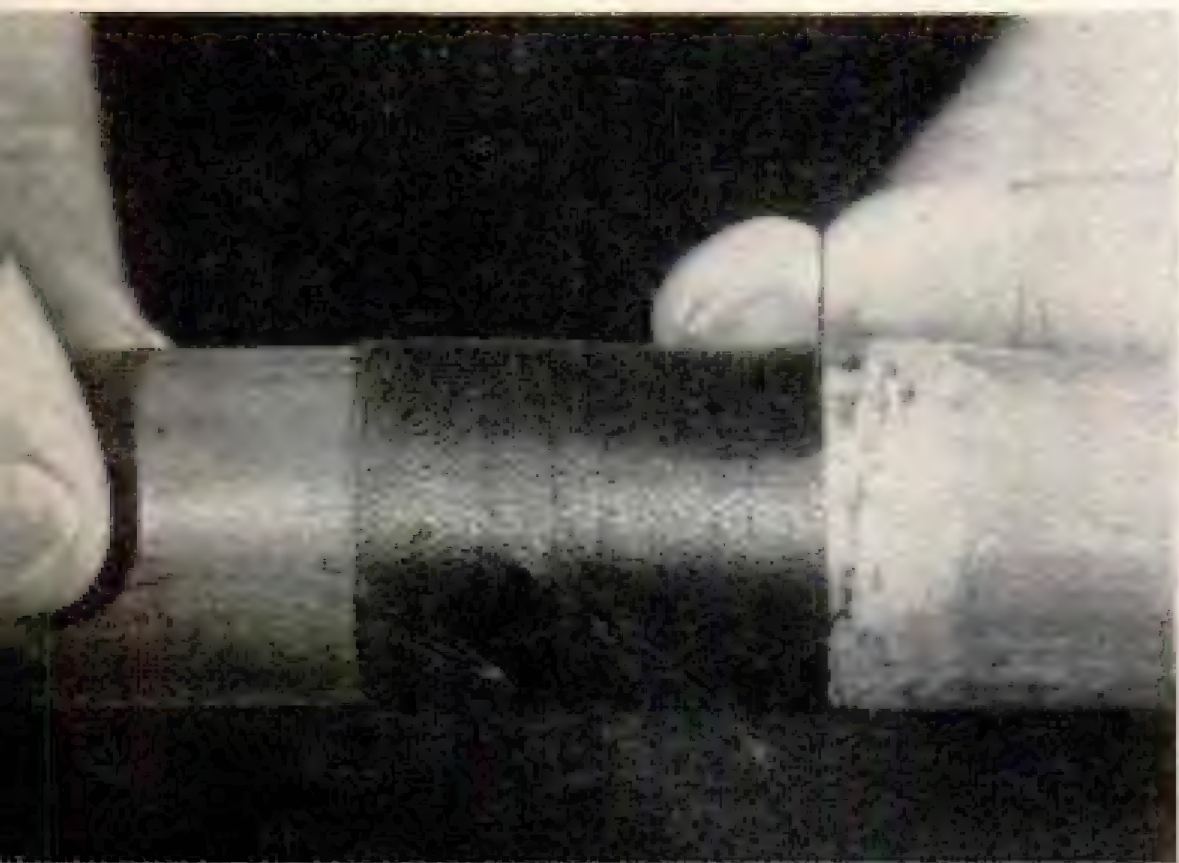
Foulproof guides of type shown are installed after second wrapping of joints. Remove rear (left in photo) tape first and wrap with thread. Then wrap front leg



Be sure tip is installed in line with reel seat. Pass line through guides and tie free end to tip. Position guides so line runs through center of eyes

Wrap joints "uphill," starting from tip side of each joint. In this way turns of fine thread will not open. Before wrapping joints, smooth with file

To secure end of wrapping, pass a loop of thread under three or four turns of wrapping. Insert end of wrapping through loop and pull under turns





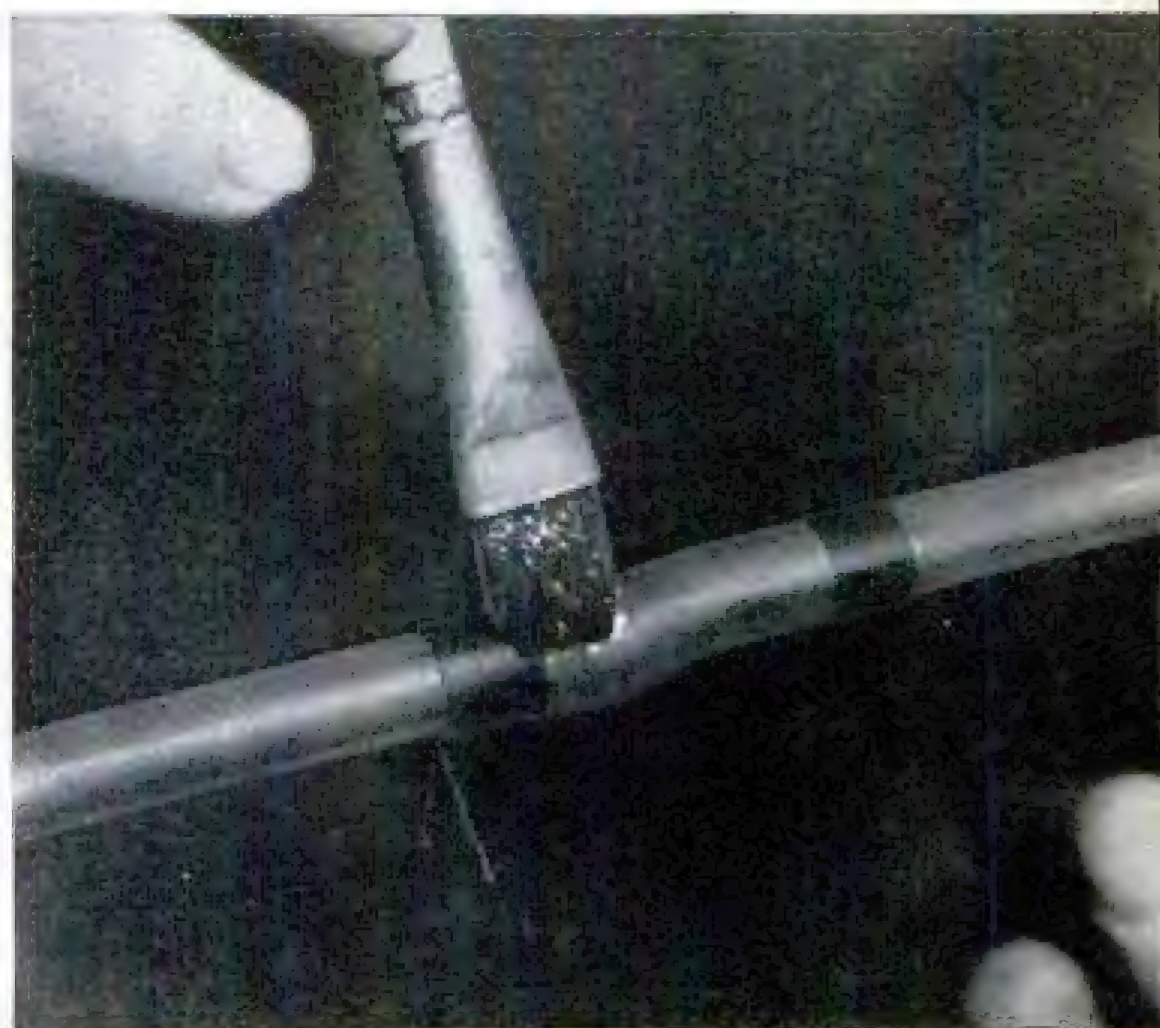
size. If the pole passes a close inspection then you're ready for the next step in making a surf rod. Suspend the pole from cords spaced about 3 ft. apart in the garage or basement workshop. Adjust the cords so that the pole hangs at a convenient height over a table or bench, as in the upper photos on the opposite page.

Tape the reel seat in place, keeping in mind that your right thumb normally rests on the reel spool as you cast. On this type of rod, most surf casters will want the reel located about 30 in. from the butt. The seat should be located in line with the spine of the rod. Pass the tape over the center of the seat, leaving the ends clear for the wrapping. Next, fit the metal tip, making sure that it lines up with the reel seat. Smooth all joint irregularities with a fine file, and then begin wrapping at the butt, using standard butt-wrapping cord made for the purpose. Two colors were used on the original, but this is a matter of choice. Start the wrapping by making three or four turns of the cord over its own end which is laid lengthwise along the butt. If you use two colors, start the second color by wrapping the first cord over the loose end of the second. Wrap one color for a distance of 1 in. or more from the butt before starting the second. Then hold the two cords side by side between the thumb and forefinger of the left hand, turning the rod with the right. The trick in making wrappings of this type is in maintaining a uniform spacing of the cord, or cords, and at the same time keeping the tension the same throughout each complete turn. When the reel seat is reached, cut the second cord and wrap over the loose end with the first one. Two or three turns before you reach the end of the wrap, lay a short loop of separate cord parallel with the axis of the rod and continue wrapping over it. Now cut the wrapping cord and pass the free end through the loop of the separate cord. Pulling on the looped cord brings the free end of the wrapping cord under two or three turns of the wrapping and anchors it firmly. Begin wrapping again above the reel seat, starting the wrap in the same manner as at the butt. Continue wrapping 6 to 8 in. above the seat, using one or two colors as desired.

Next, each joint is wrapped, using size-EE nylon thread. The wrap must extend at least 1 in. in each direction from the approximate center of the joint. Some rod makers will extend the wrap 1½ in. When wrapping the joints, work from the tip side. The reason is that almost all bamboos (Calcuttas) have a fairly sharp downward slope on the upper side of the joint, and only by wrapping from the upper side can you prevent the thread turns from opening. Joint wrapping must be done with special care as

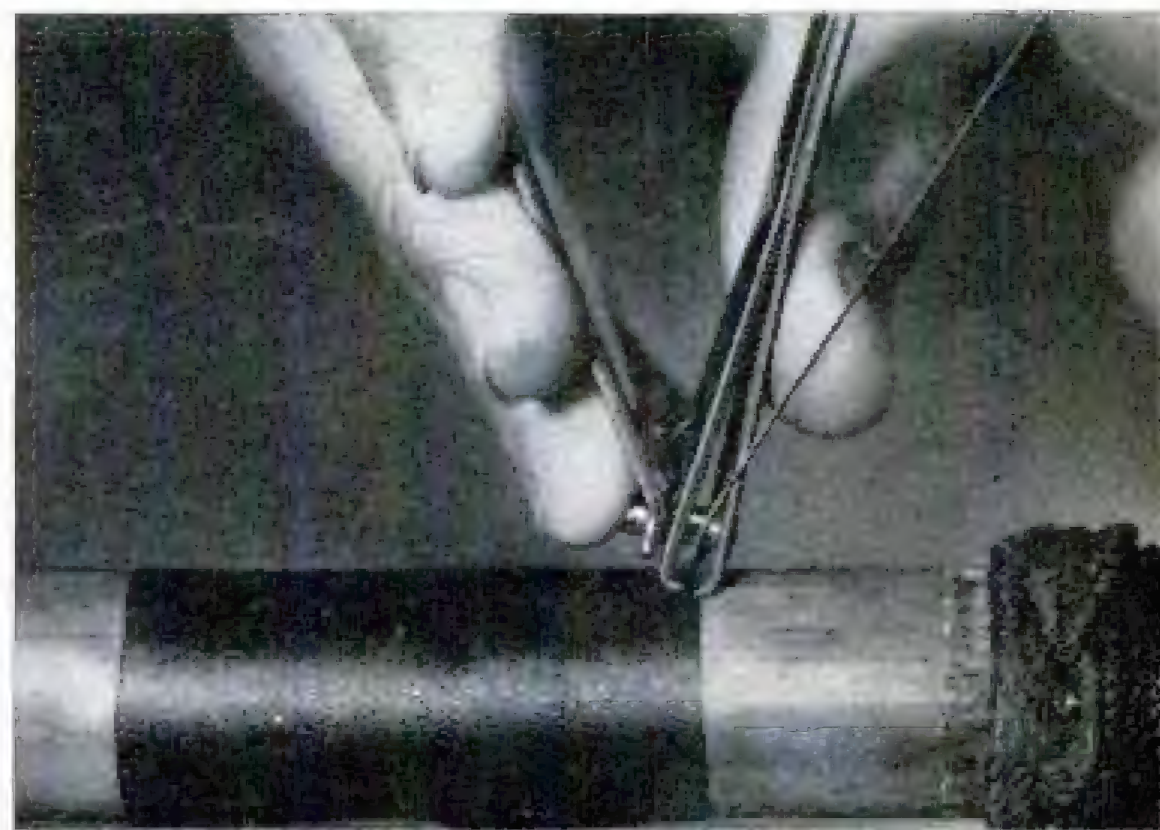


When joint wrappings are completed apply a special color preservative with finger tip. Be careful to spread a uniform coating and apply sparingly. After first coat is thoroughly dry, apply a second



Apply third, fourth and fifth coats of a color preservative with a fine-bristle brush. Be especially careful with brush to spread thin, uniform coating

Last step before varnishing rod is clipping loose ends of joint wrappings with a fingernail clipper. Ends should be trimmed closely to prevent raveling







Choice of reel is up to individual surf caster. Many prefer the spinning reel of the type shown

the strength and drive of the finished rod depend on the wrappings. After single-wrapping, the joints are double-wrapped, but before this is done the location of the guides must be determined. Attach the loaded reel and pass the free end of the line through each guide in the order of its position on the rod. Pass the line through the tip, lock the reel spool and fasten the line securely to the tip. Now locate each guide, the first one being taped in place about 36 in. above the reel. Tape the next guide about 18 in. above the first and then shorten the distance between those remaining about 2 in., or whatever approximate distance gives a fairly uniform spacing. Primarily, of course, each guide should be fitted on a wrapped joint. If new foulproof guides having widespread legs are used, then the second wrapping should be installed before positioning the guide. On old-style guides, the second wrapping is made over the legs. The color of the thread used on these wrappings is a matter of choice, but contrasting colors make the rod more attractive.

After the wrappings have been completed, treat with a special color preservative. Apply this material sparingly preferably by wetting the cord with the finger tip as in the upper photo on page 179. Allow the first coat to dry, then apply another in the same manner. When the second coat is dry, apply a third coat with a soft brush. When applying with the brush, turn the rod slowly and be sure that the material is brushed out to a thin, uniform coating. Apply the fourth and fifth coat of preservative in the same manner.

Now rig the line as you would for actual fishing and make a few practice casts across, with and against the wind. When doing this, select a spot where the line will not become fouled with sand or mud when retrieving. While you will only be simulating actual



After varnishing entire rod with several coats of rod varnish, finish the job by fitting a rubber tip

conditions, the practice casts will indicate quite accurately the spring and driving power of the rod and enable you to get the feel of it on a long cast. Keep in mind that the coats of protective varnish yet to be applied will stiffen the rod slightly and that you can stiffen it still more by adding spaced wrappings. While a rod of this type is not generally regarded as the most suitable for maximum long-distance casting, it should put out 150 ft. of line, even when it's handled somewhat less than expertly. However, it should be kept in mind that the full drive of the rod is utilized only by correct thumbing of the reel. If thumbed too late, the spool may overrun the line. If thumbed too early in the cast, the initial drive will be lost. Also, remember that a new line must be "broken in" before attempting long-distance casting. Thumb the casts short until you get the feel of the rod. Inexperienced casters should keep in mind that it's the driving power of the rod in the final half of the swing that sends the bait far out over the surf. There should be no sense of take-up or lack of spring at any point in the swing, and when you release the spool as the rod straightens, the rig should lead a taut line right out to the limit of the cast. If the rod seems capable of turning in this performance consistently, it has what it takes.

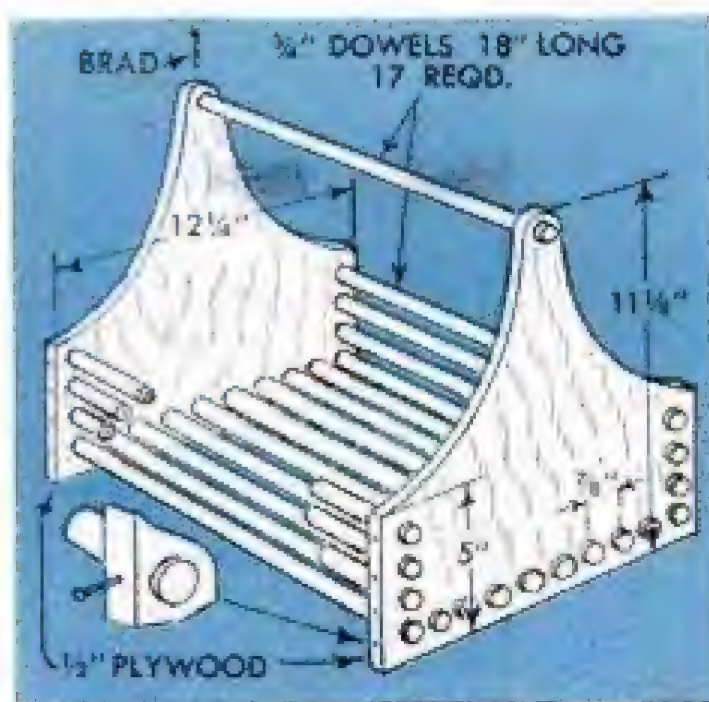
Now finish with rod varnish, applying as many coats as necessary to produce a smooth protective film. Then add a rubber butt tip as in the photo above. When fishing from a beach many surf fishermen like to use a sand spike to support the rod and line as in the lower photo on page 177. It's made from a pointed length of flat steel having a ring welded on to support the rod butt. ★★★

☐ Rain-spotted window sills can be restored by wiping with a cloth dipped in alcohol.



# Wooden Basket Serves Many Uses in Garden

You are sure to find many uses in the garden or the back yard for this attractive wooden basket made of dowels and plywood. Not only will it come in handy for carrying plants and seedlings as well as several small garden tools, but it also may be used when gathering weeds and branch prunings for disposal. Still another use for the basket is that of a firewood container for an outdoor barbecue. After cutting exterior-grade plywood to the dimensions indicated, drill holes along the sides and bottom of each end-piece to take the ends of  $\frac{3}{4}$ -in. dowels. Insert the dowels and pin with brads driven in the edges of the plywood. Allow the ends of the dowels to project  $\frac{3}{8}$  in. beyond the endpieces. Finish the assembled basket with clear shellac and a coat or two of exterior paint. If desired, a detachable wooden frame may be built that



can be either hooked or screwed to the basket endpieces to provide a magazine rack for indoor use during the winter months.

Dick Hutchinson, San Gabriel, Calif.

## Both Liquid and Wax Polishes Used for Better Shoeshine



You can give your shoes a more effective shine by using liquid and paste polishes together. The liquid polish, usually referred to as self-polishing, is applied liberally so that every crevice and indentation is coated. After the coating has dried thoroughly, apply the paste wax in the usual manner. With all pores and openings in the leather sealed, the paste wax remains on the surface and, as a result, requires little rubbing to obtain a high polish. A clean, soft cloth should be used for best results.

## Tube Fitted Over Brush Ferrule Adjusts Spread of Bristles

For certain types of work a paintbrush on which the spread of the bristles can be regulated will come in handy for reaching through narrow openings into inaccessible places. All that's needed to adapt an ordinary brush is a short piece of metal tubing that will press-fit over the ferrule of the brush, forming a sleeve as illustrated. As the sleeve is pushed down over the flared bristles, it gradually compresses them. The sleeve also may be used as a keeper whenever the brush has been cleaned and is ready for storing.







Complete tent with canopy, provides adequate shelter in rainy weather. A fire of dry hardwood located just beyond outer edge of canopy warms interior of tent to a comfortable temperature



Above, top section alone gives overnight protection in mild weather. Note 12-in. wall at the back. Below, by adding two walls and pitching tent with top to windward you can keep dry in a driving rain



Above, one wall breaks a strong wind and provides comfortable summer sleeping quarters for one or two persons. Below, by pitching top section side-wise you get a low lean-to with one closed end





# HIKERS

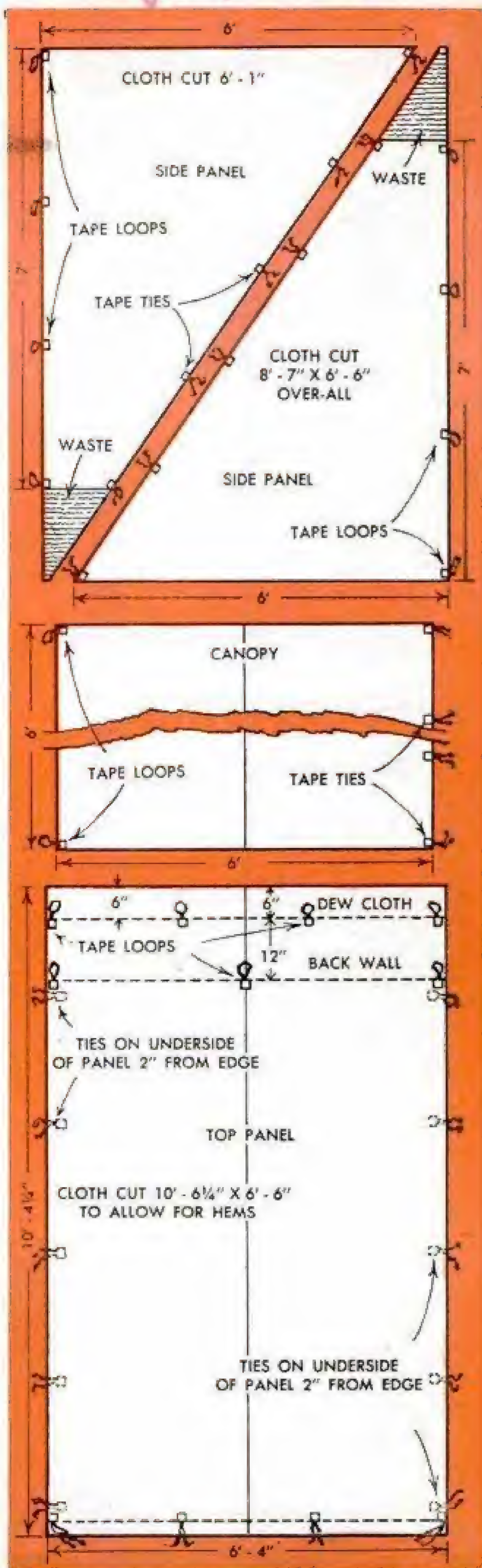
By Joe Van Wormer

**A**N OUTDOORSMAN who takes to the back trails selects his gear with an eye for utility and easy portability. When all the equipment is carried on his back between camp sites it must be light and good. Old hands on the trail usually prefer to make their own shelter tents, a typical example being the sectional tent pictured on the opposite page. It's made of unbleached muslin treated with a water repellent, and the sectional feature permits it to be pitched five different ways as the weather and temperature may require. The total weight is a little under 5 lb. less, of course, the poles which are cut at the camp site. During warm summer months you'll need only the roof section, which weighs about 2 lb. and is pitched as a lean-to. By carrying the side panels you can set up a shelter that will turn both wind and driving rain. With the canopy or fly added you can have the warmth of a protected campfire even in a downpour.

The materials required for the sectional tent of the size detailed at the right are approximately 18 yd. of 160-thread unbleached muslin 39 in. wide, 24 yd. of cotton tape and sufficient No. 40, 6-strand cotton thread to quadruple-stitch all seams and hems. The tape loops and ties are secured under 2-in. square patches of tent material quadruple-stitched at the edges and then crossed-stitched through the tape for maximum resistance to tearing. The tape ties are 20 in. long with the fold placed under the patches. The tape loops are 10 in. long and have the free ends folded under the reinforcing patches. Note that the sides tie to the top in such a way as to provide a 2-in. overhang. If desired, additional ties can be added to the side panels and top so that the latter can be drawn down over the sides and tied for a more effective weather seal.

Note in the details at the right that the ties on the sides and upper edge of the top panel are centered about 2 in. in from the edges, and that loops are placed to provide a 6-in. dew cloth and a 12-in. back wall. This wall makes the entire 6 x 7-ft. floor area usable for sheltering both bed and gear.

Carry nylon cord for pitching the tent and lashing the poles cut at the camp site. Note particularly the arrangement of the poles when pitching the tent in any of the five positions. When cutting the poles, select only live saplings. Always select a camp site on high ground so that there is adequate drainage. ★ ★ ★





## Weather-Resistant Mailbox Post Made From Welded-Pipe Lengths



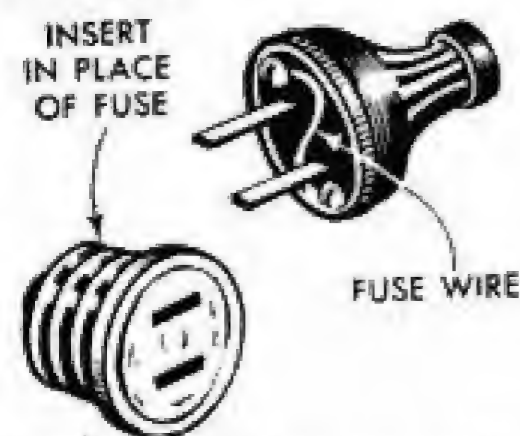
Neat appearing as well as weather-resistant, this unique mailbox post consists of 3-in. lengths of 3-in. pipe welded one above the other as shown. The post in turn is welded to a 3-ft. length of steel pipe vertically embedded in the ground. The brace under the front end of the box is made in the same manner, except that  $\frac{3}{4}$ -in. lengths of  $\frac{3}{4}$ -in. pipe are used. After setting the post

in concrete in the ground, both the post and brace are given a coat of aluminum paint to prevent rust.

Kenneth Hadenfeldt, Storm Lake, Iowa.

## Wire Replaces Standard Fuse For Experimental Work

When doing experimental electrical work during which fuses are likely to be blown frequently, it is less expensive and more convenient to replace the standard fuse with fuse wire. Use an ordinary electric screw plug as the fuse base, into which is inserted a regular male plug wired as in the illustration. Fuse wire may be purchased in any capacity, but the most convenient is 5 amp. If a 10-amp. fuse is needed, two strands of wire are used; three for a 15-amp. fuse, and so on.



Ed Packer, Chicago.

## Fishline Repaired With Nail Polish

When the finish on an enameled fishing line became cracked, one fishing enthusiast used clear nail polish to seal the damaged portion against moisture. He has also found it effective for temporarily repairing the finish on corks and plugs, as well as for covering chipped areas on a rod.

Robert Unghemah, White Plains, N. Y.

# Popular Mechanics Bookshop

## Fancy Yourself a Chef?

Then here's your dish — the brand-new *Popular Mechanics How to Build and Use Your Own Outdoor Kitchen*. It's a roundup of the latest ideas on outdoor kitchens and cooking, with instructions for making everything from grills and ovens to barbecued ribs and roasts. Drawings and photos detail the construction of fireplaces, complete kitchens, barbecue pits, portable grills and Chinese and Mexican ovens. Here, too, are fire-tested recipes for such delicacies as barbecued fowl, fish, shishkebab and special sauces. Order now from Popular Mechanics Press, 208 East Ontario St., Chicago 11. The price is \$2.00.

## Even Fishermen Have to Eat . . .

. . . and here's a book that's bound to bring trout and walleyes into the frying pan. *How to Tempt a Fish* is a handbook of angling lore and know-how, illustrated with full-

color photos, diagrams and drawings. There are separate how-to-do-it chapters for the fly caster, bait caster and salt-water angler, along with hundreds of fishing hints and kinks. *How to Tempt a Fish* makes a fine gift for any sportsman. The price is \$2.00 from Popular Mechanics Press, 208 East Ontario St., Chicago 11.

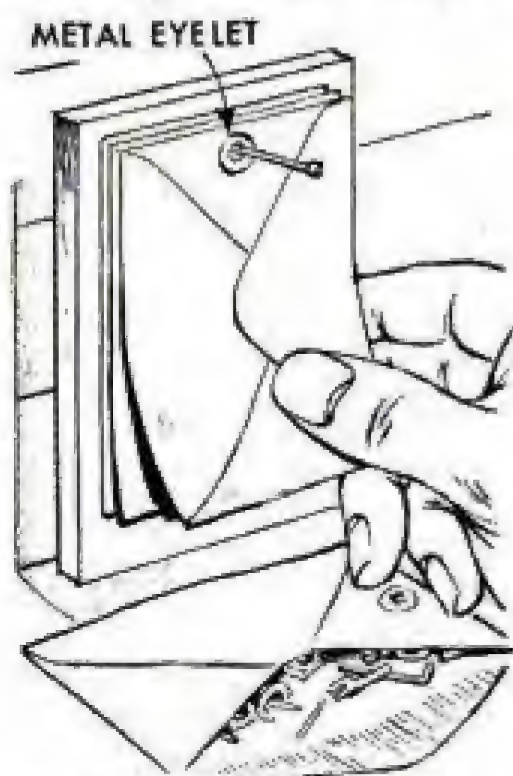
## And You'll Want to . . .

. . . photograph those back-yard get-togethers and fishing expeditions this summer. *Photokinks* is an annual handbook to help you get the perfect picture. Included are picture-taking hints, new equipment and techniques for the darkroom, four sections of salon photos, a section on color photography and pages of special information on motion pictures and slide projectors. *Photokinks* is available at your local newsstand, or order for 75c from Popular Mechanics Press, 208 East Ontario St., Chicago 11.

All books available from Popular Mechanics Book Department, 208 E. Ontario St., Chicago 11



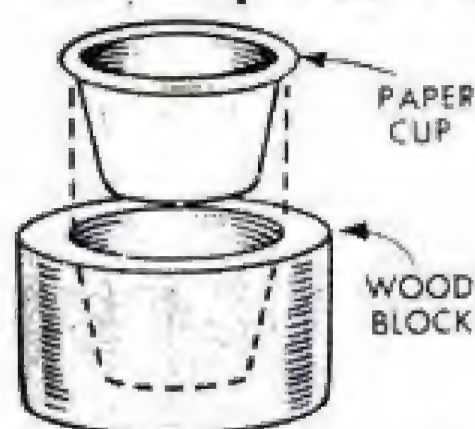
## Eyelet-Type Envelopes Used To Separate Tiny Parts



Small Manila envelopes of the type having metal eyelets are used by one hobbyist to keep tiny parts separated when working with models or making repairs on cameras or other intricate equipment. Available from any florist, the envelopes are sealed and identifying data

written on the front, after which they are slipped over a finishing nail driven in a block of wood for attaching to the wall or storing flat, as most convenient.

## Glue Cup Has Disposable Liner



Craftsmen who often mix small amounts of resin or casein glue will appreciate this wooden glue cup with its inexpensive throw-away liners. The water-

proof liners are paper candy cups of the type used at parties, and these are merely slipped into a recessed wooden base. The base can be turned in a lathe, the center being bored to suit the taper and depth of the cup, or it may be a square block cut from a length of 2 x 4. In this case the recess is cut with an expansive bit.

Robert Funk, Sacramento, Calif.

## Underseat Rack for Folding Chair



With this simple underseat rack for folding chairs, those sitting in the chairs will not have to hold hats and parcels in their laps. Heavy cloth is cut to fit between the rungs of each chair, and ties are sewn to the corners for tying the rack to the legs. The cloth will not hamper folding the chair and can be removed for washing.



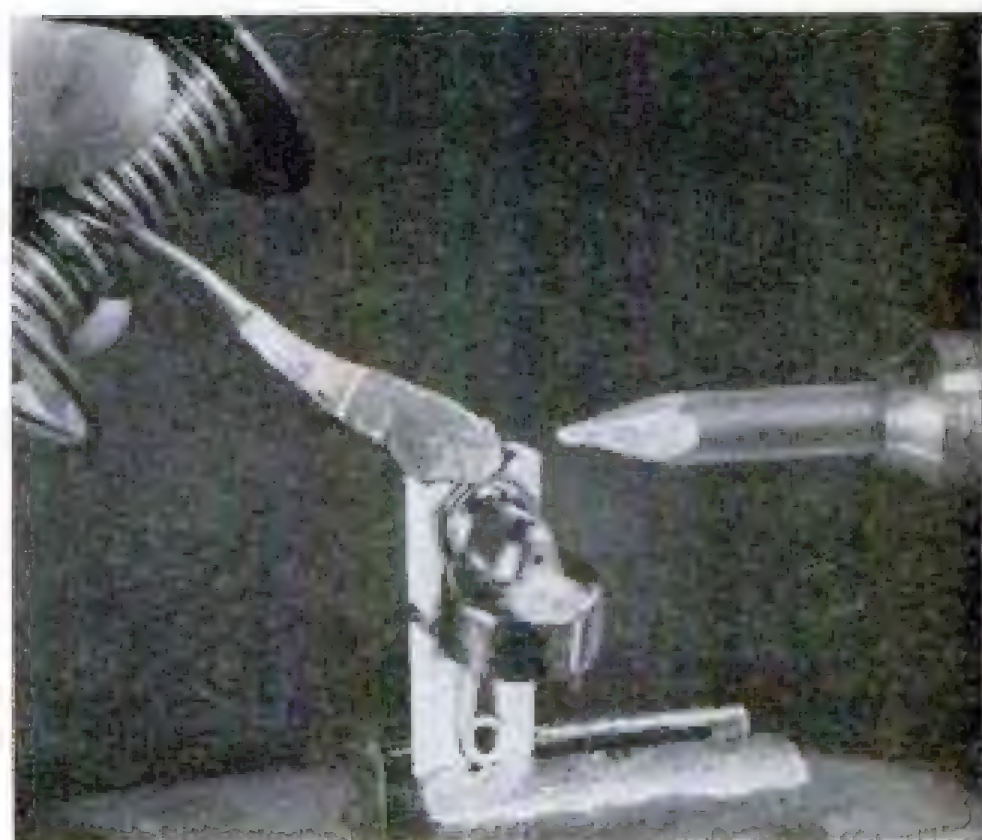
## Beach Umbrella Supports Tray That Holds Small Articles

A wooden tray resting on the struts supporting the ribs of a beach umbrella is handy for holding cigarettes, matches, sunglasses, cameras and other things that must be kept dry and out of the sand. The sides of the tray extend below the bottom to form flanges that prevent the tray from slipping out of position. The bottom of the tray is glued into dado grooves in the sides.

Bertram Brownold, Cedarhurst, N. J.

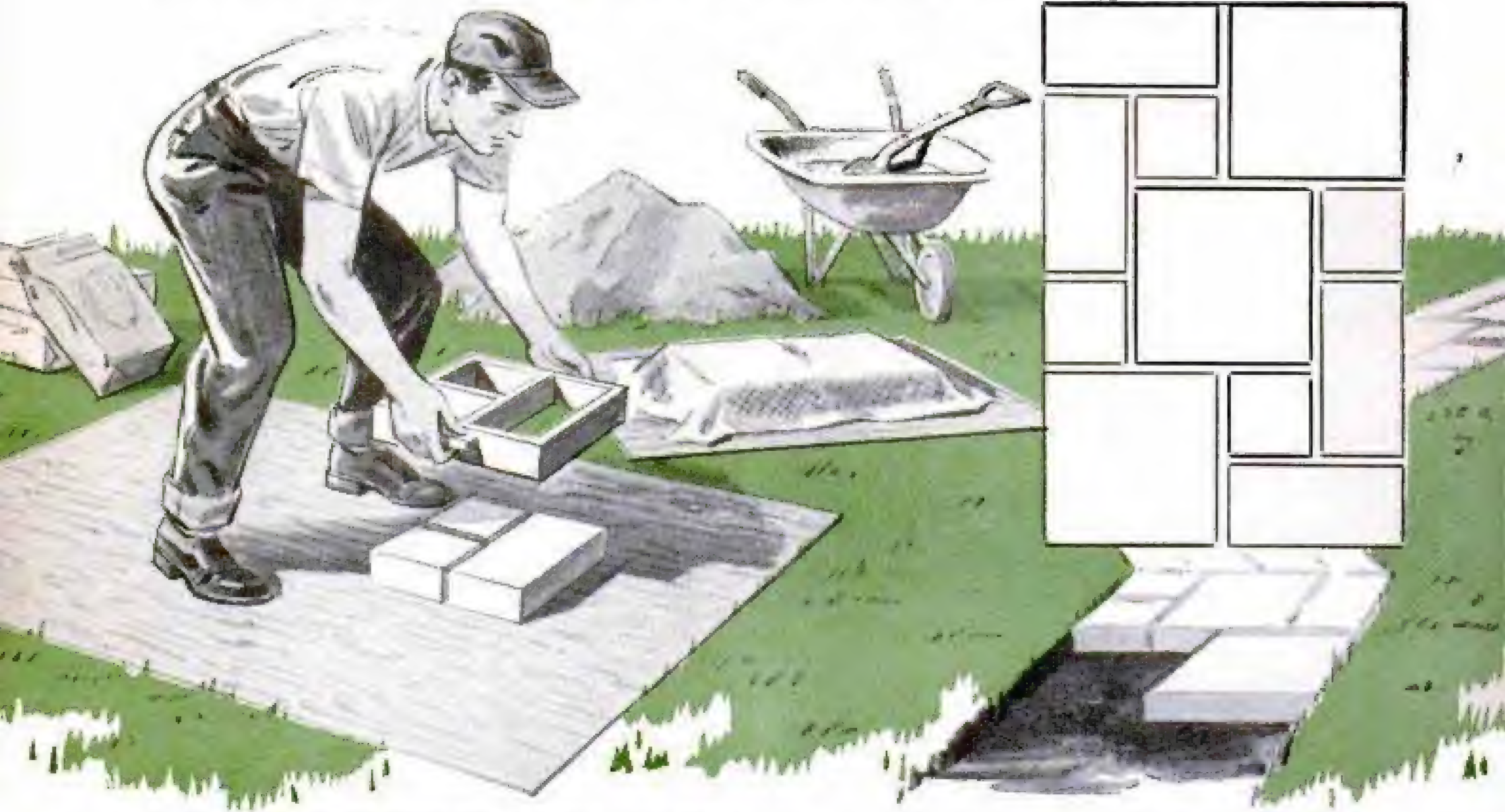
## Solder Melted More Quickly If Flattened Beforehand

On delicate soldering operations where solder must be melted instantly to avoid overheating the work, try hammering it flat beforehand. This will enable you to make it flow with little more than a touch of the iron. This trick works with cored as well as plain solder.

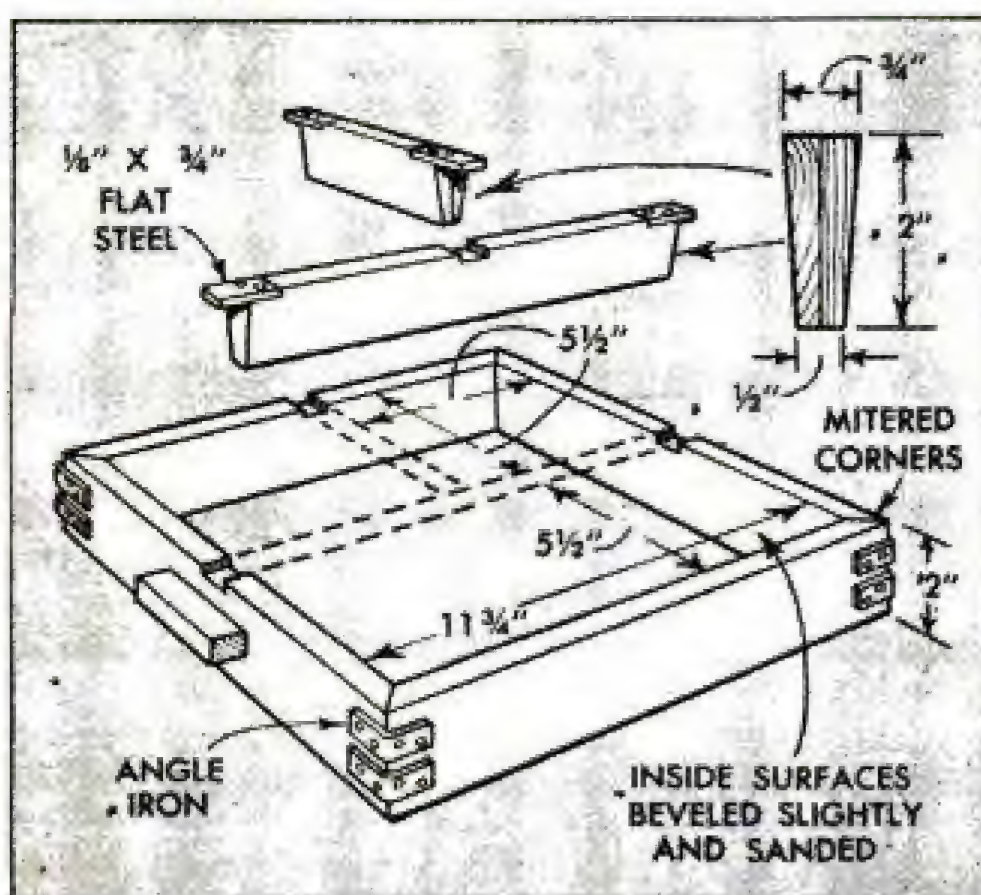




# Three-in-One FLAGSTONE MOLD



By Hi Sibley

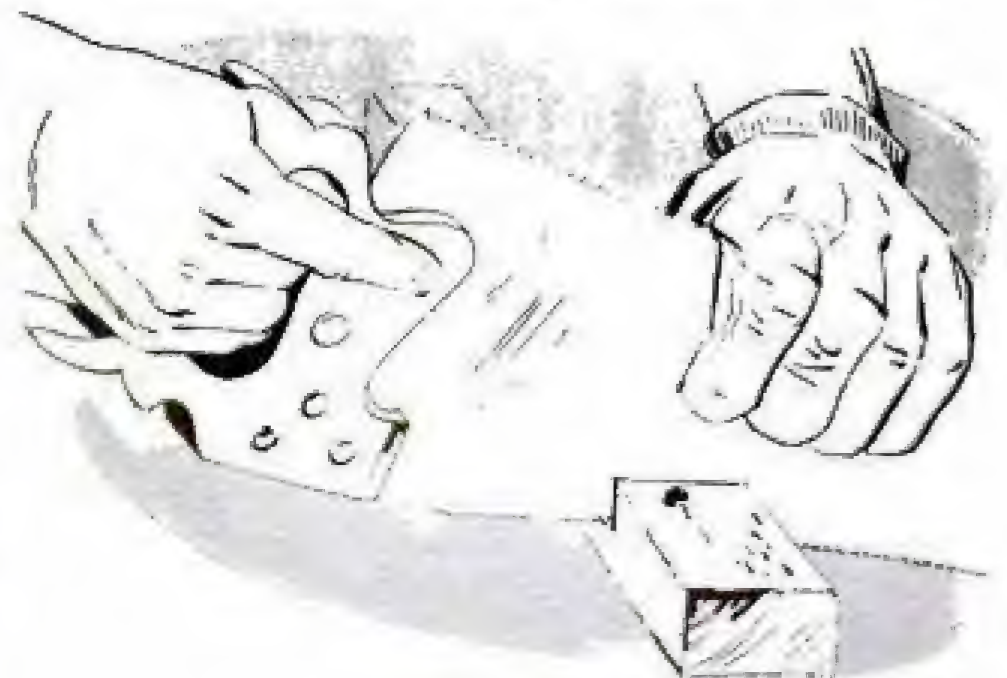


FITTED WITH REMOVABLE dividers for making flagstones in three sizes, this simple mold will enable you to work out a variety of interesting patterns when laying out a walk or terrace. The frame is  $\frac{3}{4}$ -in. stock, mitered at the corners and assembled with steel angle irons. Each divider may be two thin pieces joined together to prevent warping that are beveled and later oiled for easy removal from the concrete. The concrete consists of cement, 1 part, clean dry sand, 2 parts, and pea gravel, 3 parts. While curing, the blocks should be covered with burlap or a tarpaulin and sprinkled periodically. To provide drainage, the blocks are laid so they project  $\frac{1}{2}$  in. aboveground.

## Teeth Filed on Back Edge of Saw Blade Used for Cutting Nails

Teeth filed on the back of a handsaw blade will come in handy for cutting nails embedded in old lumber. However, for best results, the teeth should be filed at right angles to the blade and must not be set. When a nail is encountered, simply reverse the blade and cut through it. If desired, the section where the extra teeth are cut may be hardened.

☞ To keep a throw rug from slipping, cut a piece of oilcloth to the exact size of the rug and place it under the rug with the glazed side down.





Right, cars being selected from dealers' stocks by officials for Economy Run. After selection, cars were given a 2500-mile break-in. No alterations were permitted

Center, immediately after selection by officials, cars were impounded and hoods sealed. After sealing, hoods were opened only under supervision of technicians



All photos courtesy General Petroleum Corp.

# 12 WAYS TO SAVE GAS

By Ed Packer

**A**LTHOUGH ordinary good-driving practices always produce appreciable fuel savings, it's consistent observance of the little things that runs up an impressive average in miles per gallon. Motorists who like to think they drive with an eye on the fuel gauge still can profit from the practices employed by drivers in the annual Economy Runs sponsored by the General Petroleum Corp., makers of Mobiloil products. In a recent Run stock cars covered over 1400 miles at elevations ranging from below sea level to more than 8000 ft., and in temperatures varying from below freezing to over 100 deg. F. State and local traffic regulations were rigidly observed. The cars covered the distance at an average speed of nearly 41 miles per hour and turned in an average of 22



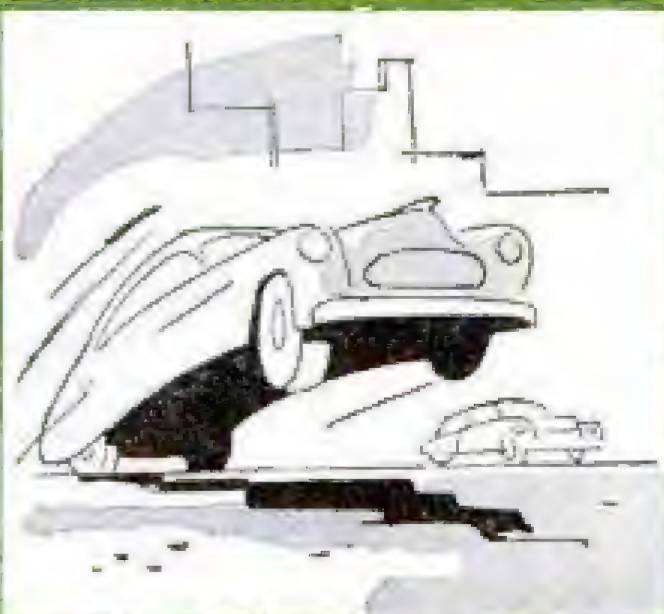
miles per gal. Note the results in the brief chart on page 190.

Hard braking at stop lights, jack-rabbit starts, improperly inflated tires, dragging brakes, wheel misalignment and an incorrectly adjusted carburetor are well-known

Hard stops not only ruin brakes but can seriously damage other car parts



Throttle-to-floor-board starts waste fuel, cut miles-per-gallon averages



On a cold morning tires are always "low." Drive slowly for a few miles







Technicians dismantle and inspect a carburetor to make certain that all parts and adjustments meet factory specifications for each car entered in the Run



Members of technical staff verify distributor adjustment and vacuum-spark advance. Careful check is made of spark as it must fall within certain tolerances

causes of low gas mileage, but there are others less familiar to drivers that cause an unnecessary fuel waste. For example, when you back out of the garage on a cold morning the tires are "low." The air in the tubes has contracted and, in effect, lowered actual pressure. Until the tires are warmed by friction, the effect is that of driving with slightly underinflated tires. Slow speeds for the first few miles with easy stops and starts at the lights will offset the fuel loss.

Sharp turns not only make the tires squeal, but raise fuel consumption due to tire slippage, power loss through the differential and actual spilling of fuel from the tank and carburetor. Free-rolling resistance of tire treads on a flat turn is quite high even at moderate speeds. When the turning speed is so high that the sidewalls of the casings fold over the rims, the resistance is equal to light braking of the wheels.

Many drivers unconsciously "pump" the accelerator pedal slightly while driving.

This should be avoided as it is one of the major "hidden" causes of low gas mileage. When cruising, the driver should form the habit of relaxing so that he can maintain a steady throttle for long periods.

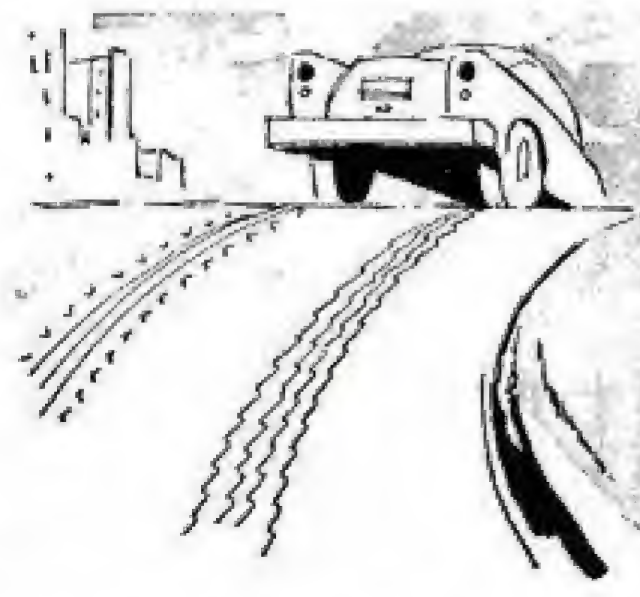
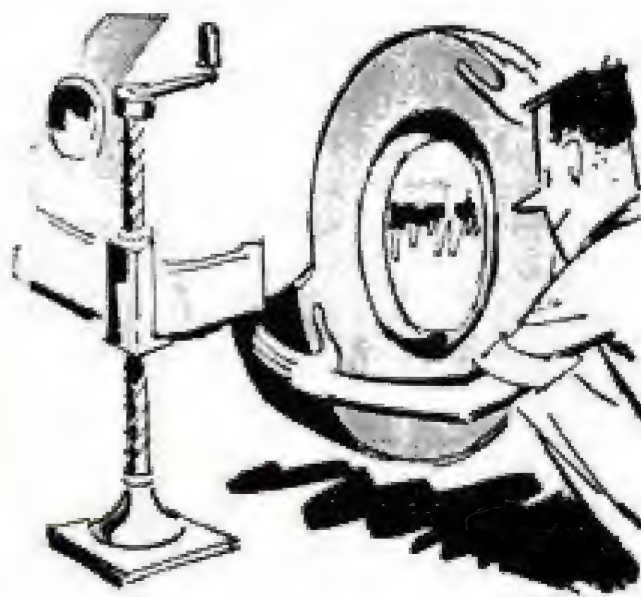
Other little things frequently overlooked are the resistance set up by tires having varying degrees of tread wear, and also installing tires of different tread types on the same car. If you purchase less than a full set of new or used tires, be sure that the individual casings are of the same tread type and also that they match the tires already on the car.

If you have an older car, lift the hood and examine the fan closely. There you will see another of the little things that contribute to fuel waste. It takes power to drive the fan and a coating of lint, mud and hardened oil on the leading edges of the blades can increase power requirements as much as 20 percent. Percentagewise, about the same thing is true when you make frequent use

Tight turns scuff off rubber and waste fuel in measurable amounts

Shift tires regularly to equalize tread wear and sidewall stresses

To minimize rolling friction always use tires of same tread type



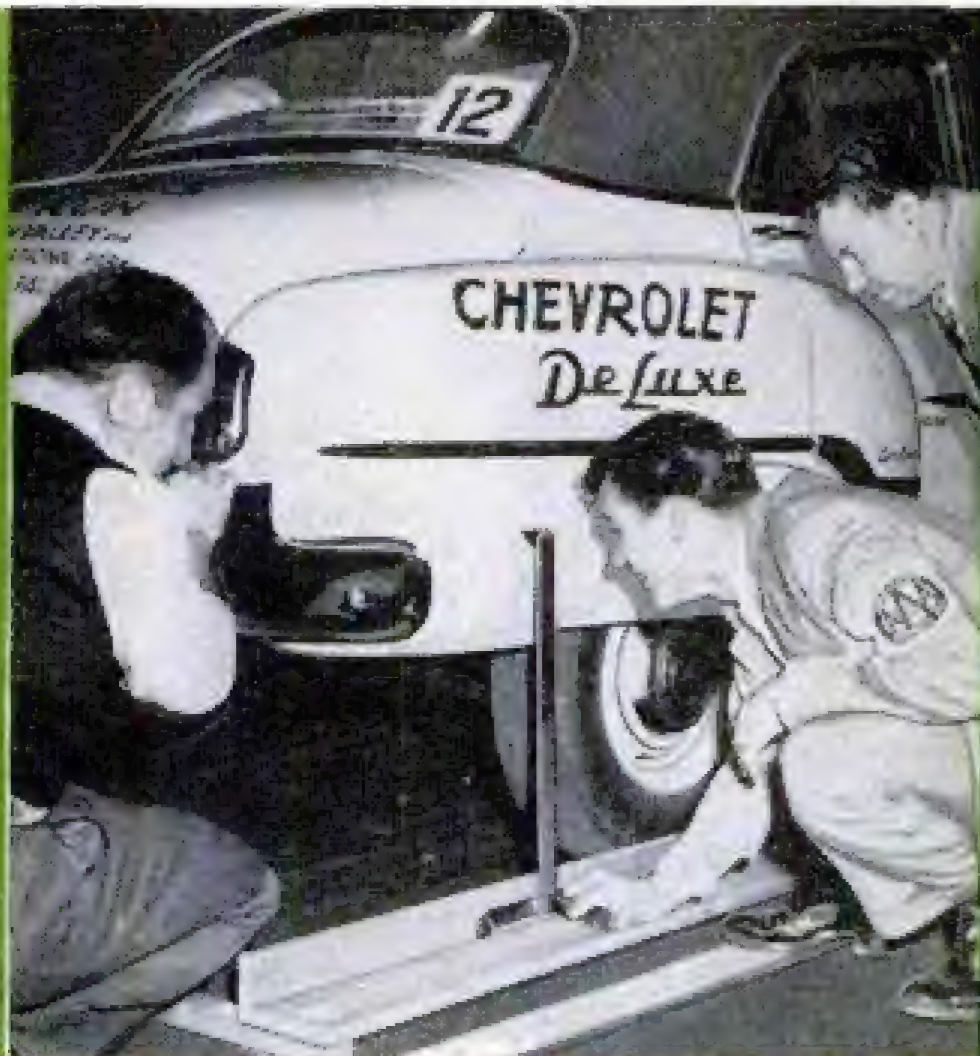




Technician making final inspection of timing and carburetor settings with test stand. Cars are under constant official supervision after selection

of the lighter, radio, heater and cooling fan. The generator must replace the high battery drain of these accessories, especially when they are used in combination. This takes added power and increases fuel consumption proportionately. Careful drivers use accessories sparingly.

One of the heavier cars delivering an exceptionally high mileage in a recent Economy Run was equipped with an automatic transmission. Manufacturers of cars fitted with automatic transmissions usually give complete directions for operation in the owner's manual furnished with the car. As a rule, points that will be stressed are the proper use of the high and low ranges and maintenance of the engine at its highest efficiency. Careful observance of the instructions for operation in the high, or drive range, and the low, or power range of the transmission, and special attention to the acceleration and deceleration practices recommended, will pay off in mileages equal



Checking leveling mark for filling fuel tank. At end of Run each car was placed in same position to obtain precise check on the amount of fuel consumed

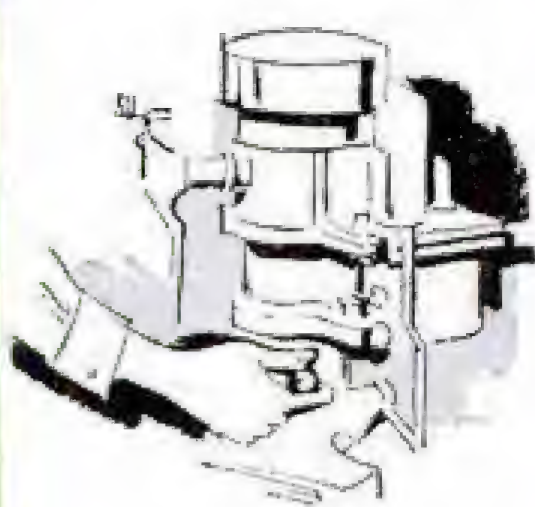
to, or even surpassing, those of cars with conventional shift-type transmissions.

Continuous high-speed driving tends to thicken crankcase oils, even those designed for sustained high-speed service. Drivers who operate a car from 500 to 1000 miles a week at moderately high cross-country speeds should time oil changes accordingly. The length of time or the miles between oil changes depend on the driving conditions, such as the type of roads, temperatures and so on. Car manufacturers make definite recommendations for these special conditions and these should be followed as closely as possible. High-speed driving in warm climates builds up crankcase sludges and certain other gummy deposits quickly when the oil is nearing the end of its normal service period. This creates a condition sometimes referred to by mechanics as "oil drag." If not corrected immediately it can reduce engine efficiency and increase fuel consumption as much as 20 percent. When

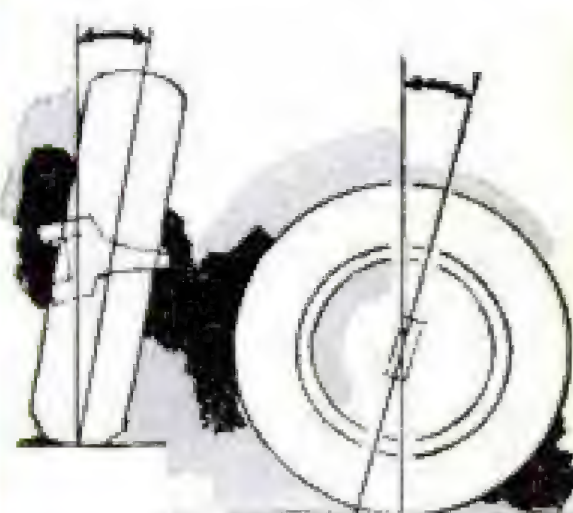
"Pumping" accelerator while driving is hidden cause of fuel waste



First step to appreciable fuel savings is carburetor adjustment



Among other fuel-saving measures is maintenance of wheel alignment







First car in 1952 Economy Run gets flag from starter, A. C. Agajanian. Others followed at two-minute intervals. First day's run was 515 miles in 12 hrs., 53 min.; second day's run 575 miles with 14 hrs. allowed

#### ECONOMY RUN AT A GLANCE

Average weight, all cars	3889.40
Oil consumption total of all cars	44 pints
Most oil consumed by one car	6 pints
Most gasoline consumed by one car	87.1755
Least gasoline consumed by one car	45.8714
Cars adding water	5 cars
Highest ton m.p.g.	59.7118
Lowest ton m.p.g.	40.8065
Highest m.p.g.	30.8558
Lowest m.p.g.	16.2362
Over-all m.p.g. average of all cars	22.0057
Average gasoline consumed by all cars	66.1326 gal.
Average speed	40.846

you replace spark plugs be sure to obtain the type suitable for your car and the kind of driving you do. Use "cold" plugs for high-speed driving and "hot" plugs for intermittent use in a cool climate.

Drivers who observe regular good-driving practices consistently keep an eye on chassis-lubrication schedules, engine tem-

perature and the condition of the ignition system, wheel alignment and regular tire changes from wheel to wheel, front and rear. Periodic checks catch defects early, keeping service and repair costs to a minimum from year to year.

Many carburetors have fuel valves controlled by manifold vacuum. When vacuum drops, as on sudden acceleration or when climbing a steep grade, the mixture is enriched automatically. To prevent fuel waste under these conditions, careful drivers avoid sharp acceleration and never permit the engine to "lug" when climbing a hill.

Gasoline forms a gum deposit on all surfaces in the fuel system with which it comes in contact, and in time this builds up to a point where it restricts fixed openings in the carburetor, making it difficult to maintain smooth idling of the engine. Solvents available in special containers make it possible to thoroughly clean gums from the carburetor without removing or dismantling the unit. After cleaning carburetor

Oil changes are determined by car usage. Short runs in cold weather mean very rapid oil contamination

Keep a close check on electrical system, especially parts of distributor and vacuum-spark control

When driving keep an eye on engine temperature. Check up immediately on sudden, wide variations

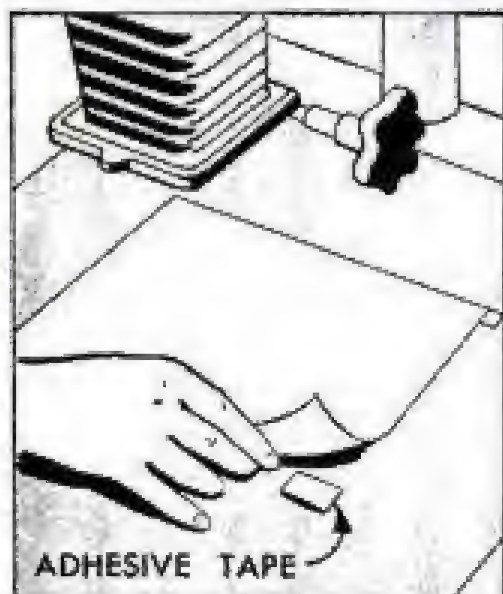




both inside and out with solvent, check carefully for air leaks at the flange, the throttle-valve shaft and also at the intake manifold. A slight air leak at any of these three points can cause serious carburetion irregularities. If the car is hard to start, especially in warm weather, an air leak is among the possible causes.

In older cars it's wise to keep a close check on the condition of the ignition system. Check the condition of the breaker points frequently and take a close look at the breaker-arm springs. A spot of rust on either one of the springs can cause trouble. It's also a good idea to have the spark timing checked frequently. ★ ★ ★

## Tape Anchors Printing Paper For Borderless Enlargements



Four pieces of adhesive tape fastened to the baseboard of an enlarger with rubber cement can be used to anchor the printing paper when making borderless enlargements. They are placed to fit under the corners of the

paper. Being white, the squares of tape are visible under the darkroom safelight so that new sheets of paper may be placed on them rapidly.—H. Klein, Pittsburgh, Pa.

## Improvised Reflector Stand



No longer do I lose valuable time devising suitable supports for clamp-on photo reflectors since hitting upon an idea for making an extra reflector do the job. The extra reflector simply is placed face down on a flat surface in

the position desired, after which the other reflector is clamped to it.

Eugene Lee Burner, Morgantown, W. Va.

## Riding the Waves

Racing towards shore on the crest of a giant wave while balancing on a surfboard can't be beaten for thrills and sheer fun! Now it's possible for you to construct a lighter, more buoyant board of foam plastic—as described next month!



## Camera Turned on Pan Head To Shoot Unusual Angles

Architectural-design studies and dramatic portraits sometimes require framing far from the usual vertical composition, and it is occasionally impossible to get the necessary degree of side tilt with the camera mounted on a tripod in the normal way. To remedy this, simply turn the camera sideways on the pan head, utilizing the vertical tilt of the head to angle the camera either to the right or left. However, with the camera mounted in this way, any vertical adjustment of the camera angle will have to be made by extending or retracting the tripod legs.—Jack Wilson, Hollywood, Calif.

## Storing Print Tongs in Darkroom

The staple plate of a large hasp provides a convenient hanger for storing print tongs in the darkroom. It is fastened to the wall or inside a cabinet with wood screws, after which one handle of the tongs is slipped into the staple as shown.



☐ Extremely dense negatives often may be used if a photoflood bulb is substituted for an ordinary one in the printer.



# 35-mm. CARRYING

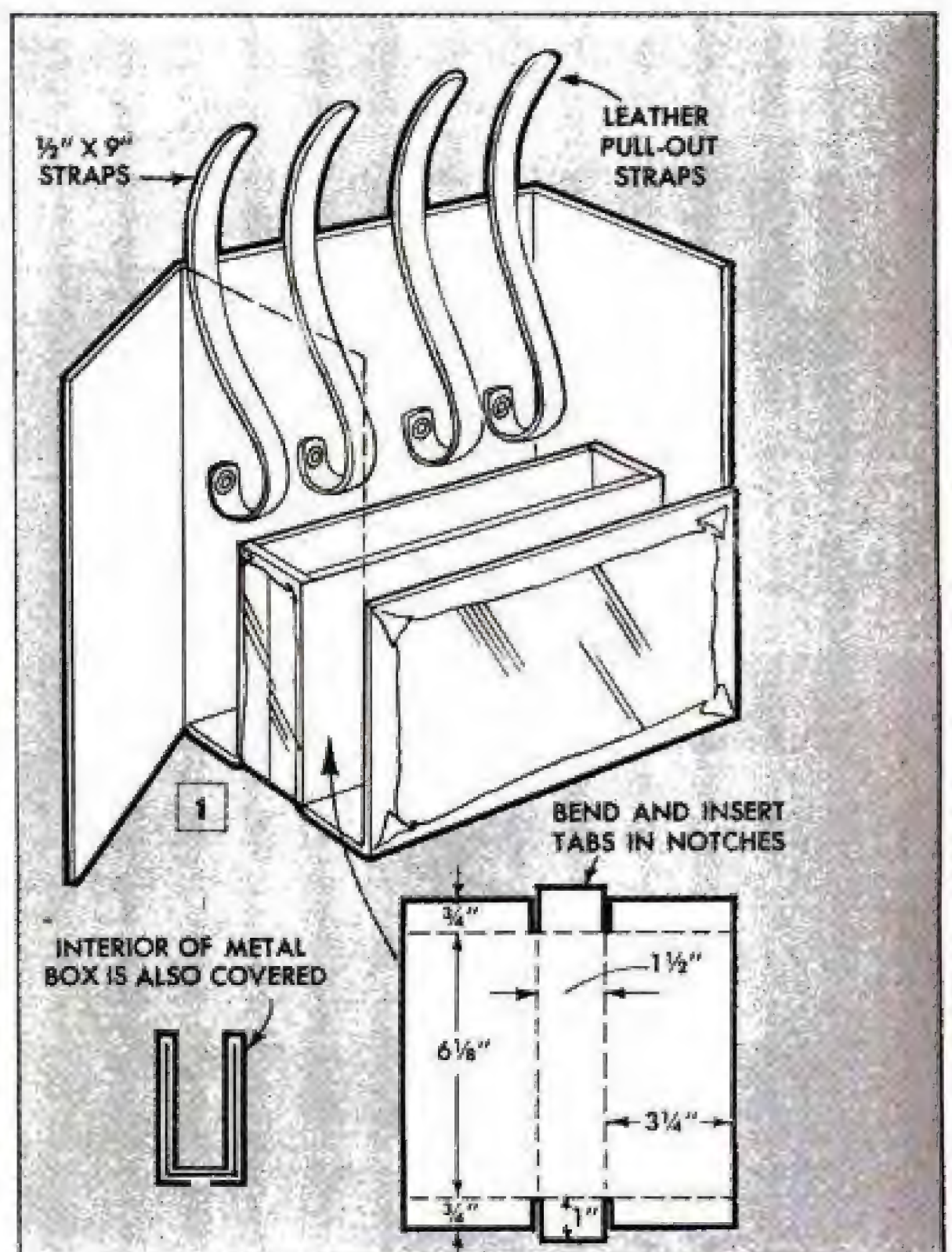


Left-hand photo shows the finished case with camera and accessories in place. Right-hand photo pictures lined metal box and pull-out straps attached to metal liner, which has been partially bent to shape. Note that the liner is lined inside with a pile plush

## SEVERAL HANDY REFINEMENTS

distinguish this camera case from the ordinary leather gadget bag. A sheet-metal box provides a rigid form for the leather covering and also storage space for four rolls of film, a light meter, a bottle of lens cleaner, lens tissues, exposure guide, extra lens holder, cable, hood and camera. Use sheet aluminum for the metal form. An .032-in. sheet is just right for the purpose. From the details in Fig. 1 you can get a clear idea of how the form is made, but before you cut any materials note the dimensions in Fig. 2 and then measure the over-all size of your camera to make sure that it will fit. In measuring, allow for the thickness of the inner fabric lining of the metal form, or liner, Fig. 3. Before making the metal form, decide on the type of fabric lining you prefer to use. A standing-pile fabric, such as brown velvet, is probably the best choice. Of course, soft leather can be used.

Now lay out the pattern for the metal box, or compartment, Fig. 1, and the metal liner, Fig. 2. Care must be used to obtain an accurate layout so that all accessories will fit easily into place. When nothing else is available, the metal can be bent quite accurately over a square-edged hardwood block. Note the



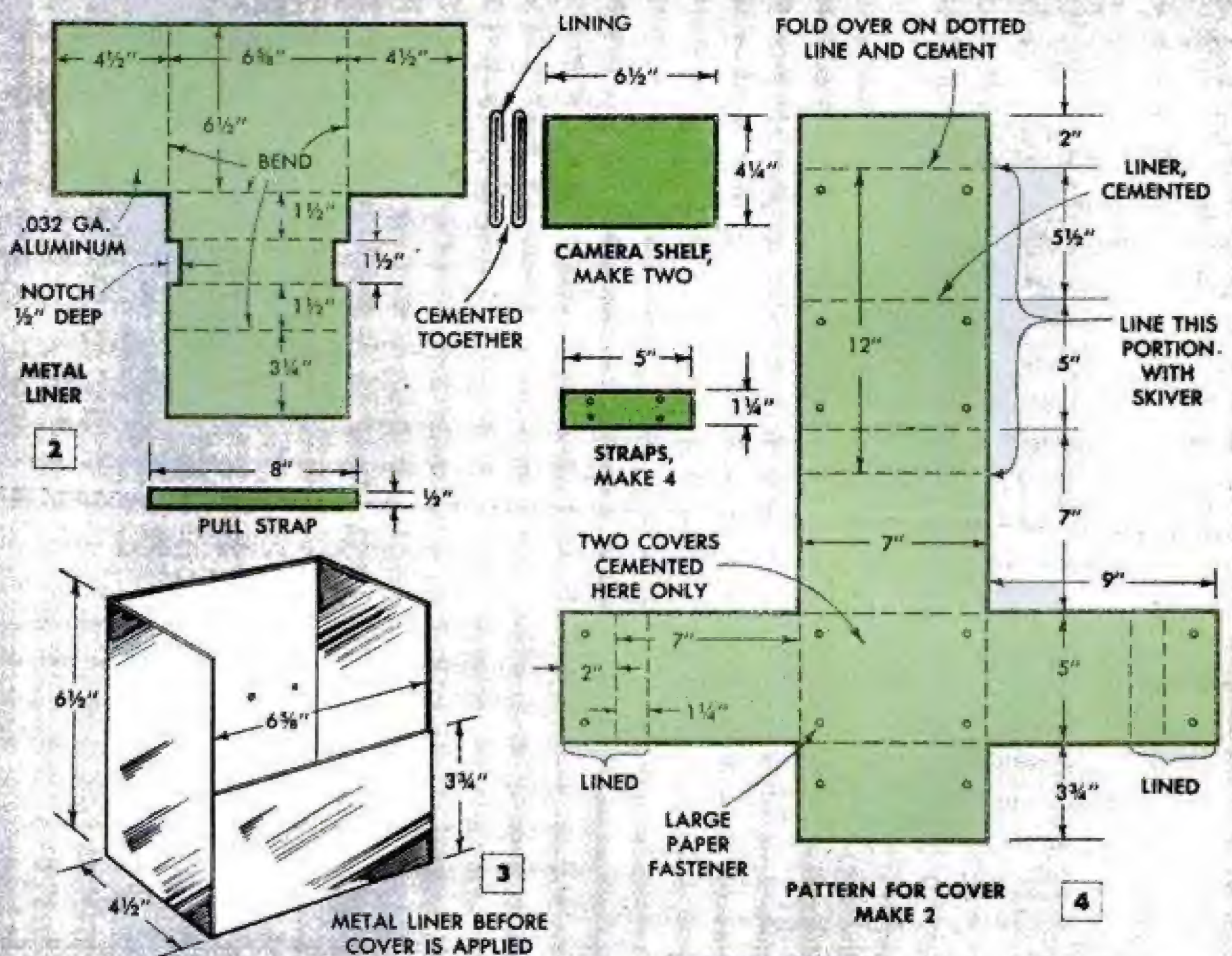


# CASE

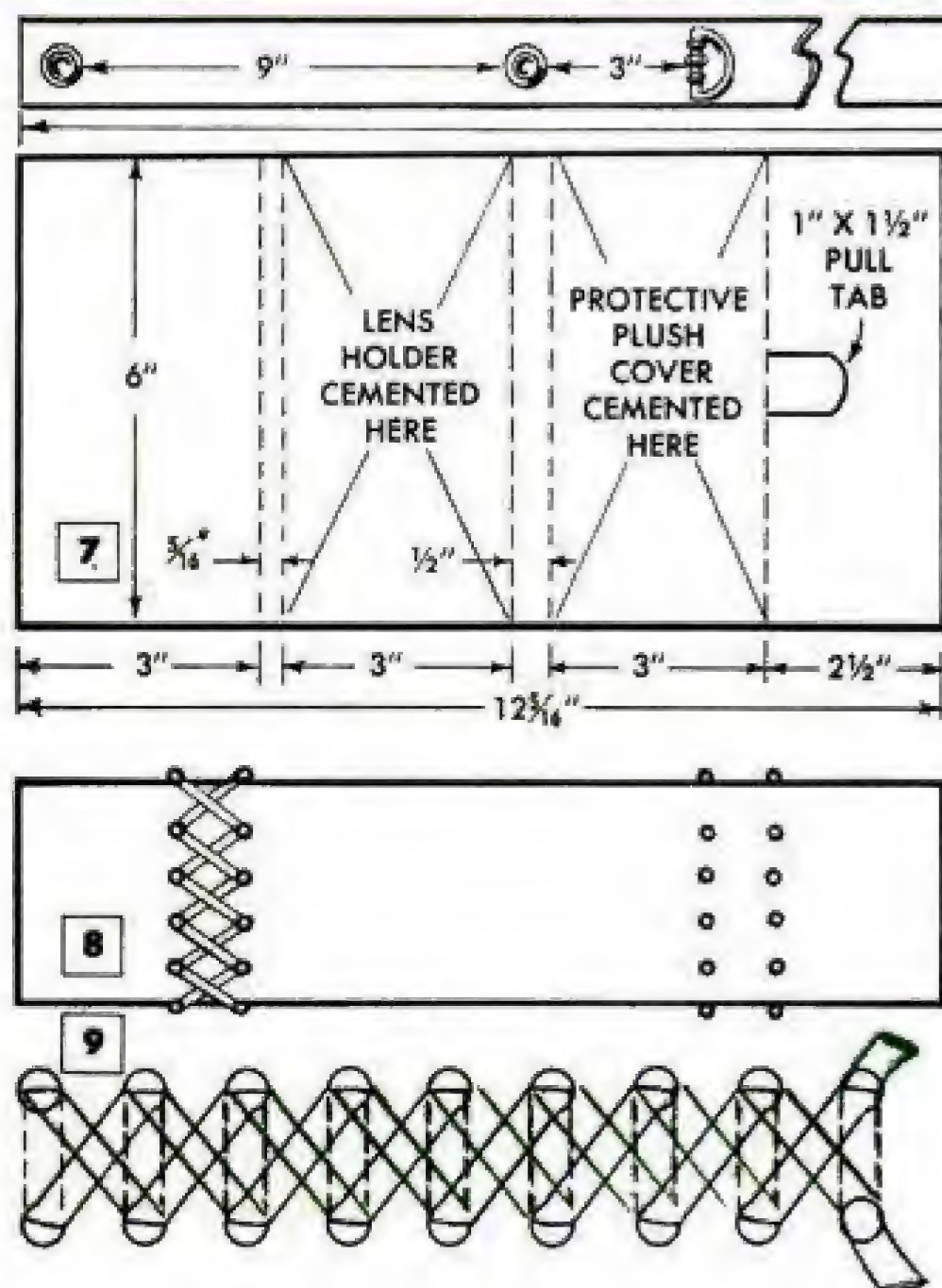
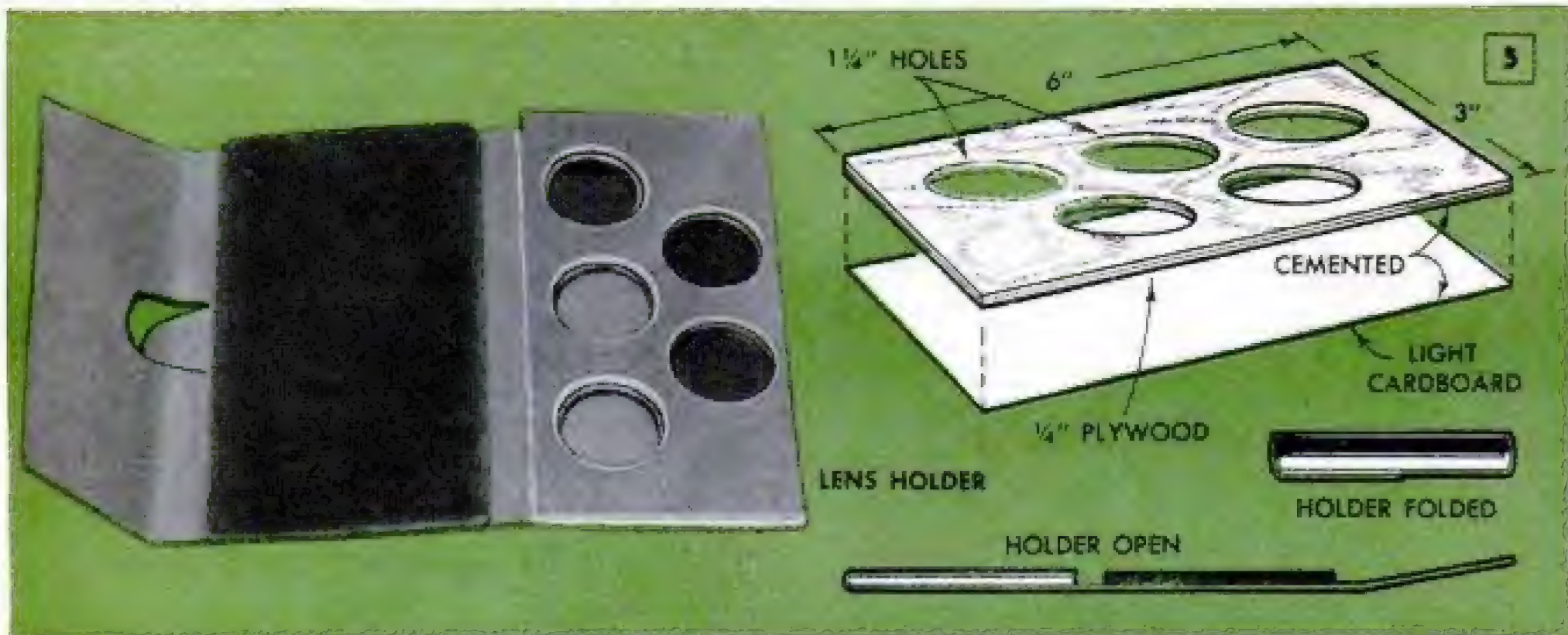
By Albert P. Belanger



All the accessories you see in this photo fit inside the case, including the camera. Pull-out straps lift rolls of film from the back of the compartment. Three pairs of snap fasteners close the case securely







1/2 x 1 1/2-in. notches cut in the metal liner, Fig. 2. These are designed to house the sling strap which passes under the metal bottom and between it and the outside leather covering. If you prefer a short hand strap for carrying, then the sling strap, Fig. 2, can be 1/2 in. wide as indicated. However, if you use a shoulder sling, Fig. 6, cut the sling strap 1 1/2 in. wide. Either the hand strap or the shoulder strap can be attached to the sling with snap fasteners or by lacing as shown in the left-hand photo, page 192.

Due to the narrow width of the metal storage box, Fig. 1, it probably will be easier to line it before bending to shape. Cut the lining slightly oversize and cement in place. Note that both the inside and outside of the box are lined, making it neces-

sary to leave tabs when cutting the fabric. Fold these over the ends and cement them in place. The fabric is not cemented to the metal tabs which are bent down and inserted in notches in the metal liner, Fig. 2. In the assembly, the metal tabs are bent flat against the bottom of the liner to hold the storage box in place. Before cutting the fabric lining for the interior of the metal liner, drill holes for the rivets holding the pull-out straps, Fig. 1, in place. Note how these straps are riveted over the lining in the right-hand photo on page 192. Here the lining is shown cemented in place with the metal box in position and the liner partially bent to shape. Cut the fabric lining oversize so the edges can be folded over and cemented to the outside of the metal liner as indicated in Fig. 1.

With this done and the metal liner bent to final shape, cut the leather covering, using the dimensions on the pattern, Fig. 4. Note especially the location of the holes for the snap fasteners. In the pattern, Fig. 4, the corners of the inside flaps are shown square. Before lacing, the corners are rounded to a radius of about 1/2 in. See the photos of the finished case on pages 192 and 193. Lace the cover with a leather lacing of your color choice, following the lace pattern in Figs. 8 and 9. Then add the snap fasteners. The camera shelves and eye straps are made as in the details in Fig. 4. The latter can be riveted in place after the covering has been finished. Cement the covering to the ends and back of the metal liner.

Fig. 5 details an auxiliary lens holder made especially to fit this case. The plywood frame of the holder is detailed in Fig. 5 and the leather cover in Fig. 7. Note the positions of the holder and the protective plush lens cover. Both are cemented to the leather cover. ★ ★ ★



SN 56

## ROLLING SHOP CABINET

By Robert Hoppough

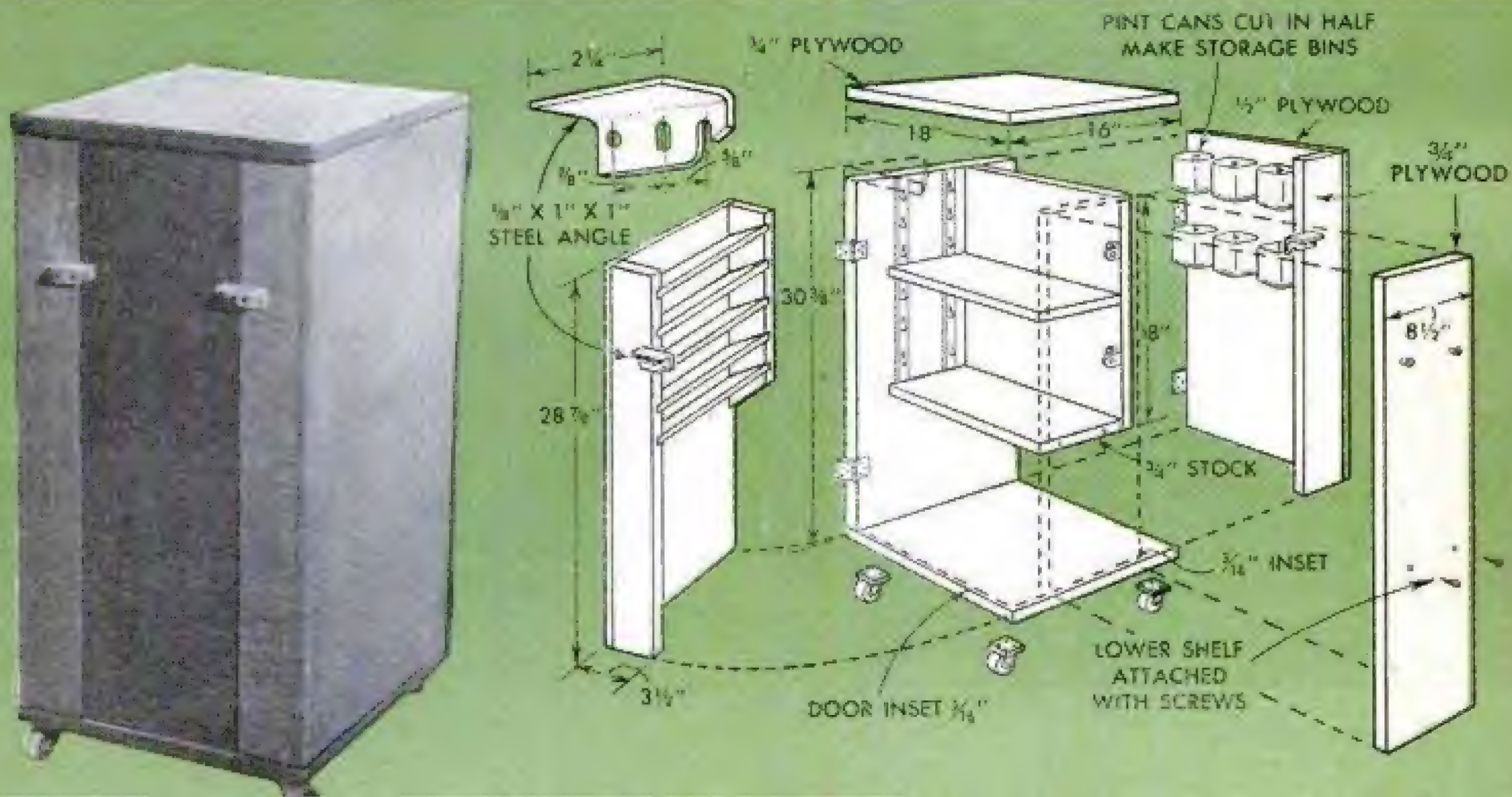
IF WORKSHOP AREA is limited, especially when it comes to convenient storage, you will want this little roll-away shop cabinet. Mounted on four casters, it is moved effortlessly wherever desired and tucked away in a corner when not in use. Sides of the cabinet consist of storage doors which swing outward for easy selection of small parts.

Although the original cabinet was designed purely to hold small parts and used in addition to other shop facilities, the cabinet can be adapted to serve as a self-contained shop by fitting one or both doors as tool panels and using the inside shelves for the small parts and supplies. When the doors are used for small-parts storage, as detailed, two types of racks or bins are mounted on them. One door is fitted with slanted shelves for boxes of bolts, screws, etc., and the other door is lined with rectangular cans for holding unpackaged parts.

The doors are held closed with a pair of self-locking latches cut and bent from sheet metal. Each latch is drilled, slotted and notched, and then pivoted to a door with a bolt or screw. A second screw driven through the slot holds the latch in locking position, while the notched end of the latch engages a screw driven into the cabinet front.



Illustration above shows how the sides of the rolling cabinet swing open for easy selection of small parts





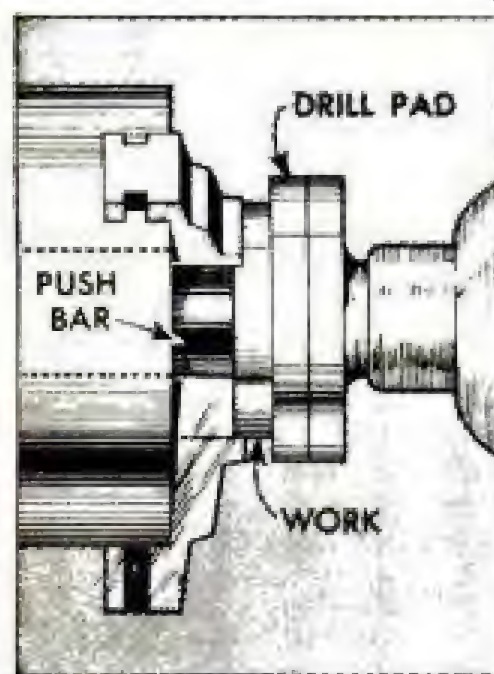
## Hand Rest for Sign Painter Improvised From T-Square

### PAINT STOP



This convenient hand rest for sign painters may be improvised easily from a T-square and several rubber bands. Simply slip one or two bands over each end of the T-square head to help prevent slipping and employ the square in the manner indicated.

## Thin Work Chucked to Run True On Metal Lathe by Drill Pad



Thin metal disks and squares can be chucked quickly to run true for facing operations in the lathe by mounting a drill pad in the tailstock and moving it close to the chuck jaws. The work then can be pushed firmly against the drill pad with a rod run through the head-

stock spindle. When the chuck jaws are tightened with the work in this position and the drill pad removed, the work will project slightly beyond the jaws and the face of the work will run true.

## Ice Lowers Heavy Equipment

A heavy piece of equipment that was to be lowered into a cement-lined pit, 30 in. deep, presented a problem, as the location of the installation did not permit use of a hoist. The problem was solved by first filling the pit with 300-lb. cakes of ice. The machine was then moved into position on

the ice, and the latter quickly melted by hot water. As the ice melted, the machinery was gradually lowered into place.

Charles Niehuis, Phoenix, Ariz.

## Locating Oil or Gasoline Leaks

If the housing of the transmission, carburetor, or other casting on your car has a crack in it that is difficult to locate, coat a little bearing blue over the suspected areas to simplify locating the breaks. First, clean the areas to be treated and then coat them with a solution of bearing blue in alcohol. This done, carefully examine the opposite side of each treated surface for traces of blue stain. In the case of small objects such as the carburetor bowl, the results usually are quicker and more positive if the part is filled with the solution.

## Portable Welding Stand Used Outside Of Shop

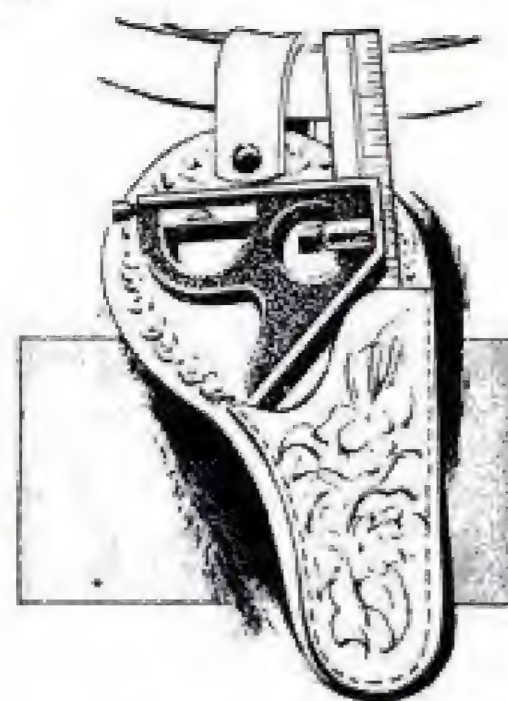
This handy welding stand is light and easy to carry for use in repairing equipment outside of the shop. The base is a wheel from an old car, to which a 3-in. pipe is welded to serve as the post. The table is a rectangular frame of angle steel covered with sheet steel. A stop is welded to the back of the table with a clamp mounted on it. A short cross rod is welded across the post high enough from the base to serve conveniently as a hook on which to hang the torch.

A. M. Wettach, Mt. Pleasant, Iowa.



## Carry Combination Square In Toy-Gun Holster

I find that the holster for a toy cowboy gun is ideal for carrying a combination square. Strapped to my belt within reach of either hand, the holster frees both hands for working from a ladder. — R. M. Woodbury, Natick, Mass.





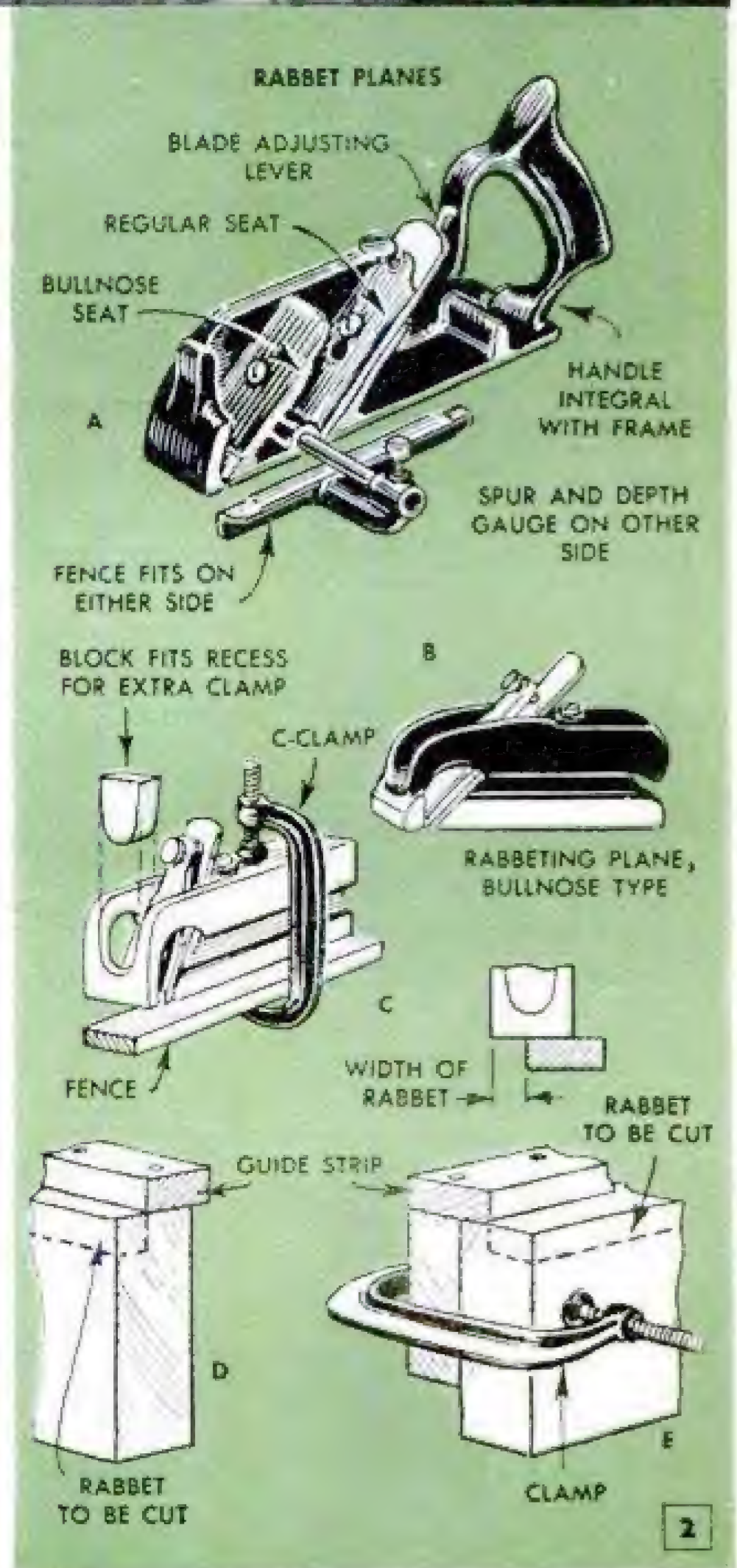
# Special-Purpose PLANES and SCRAPERS

By E. R. Haan

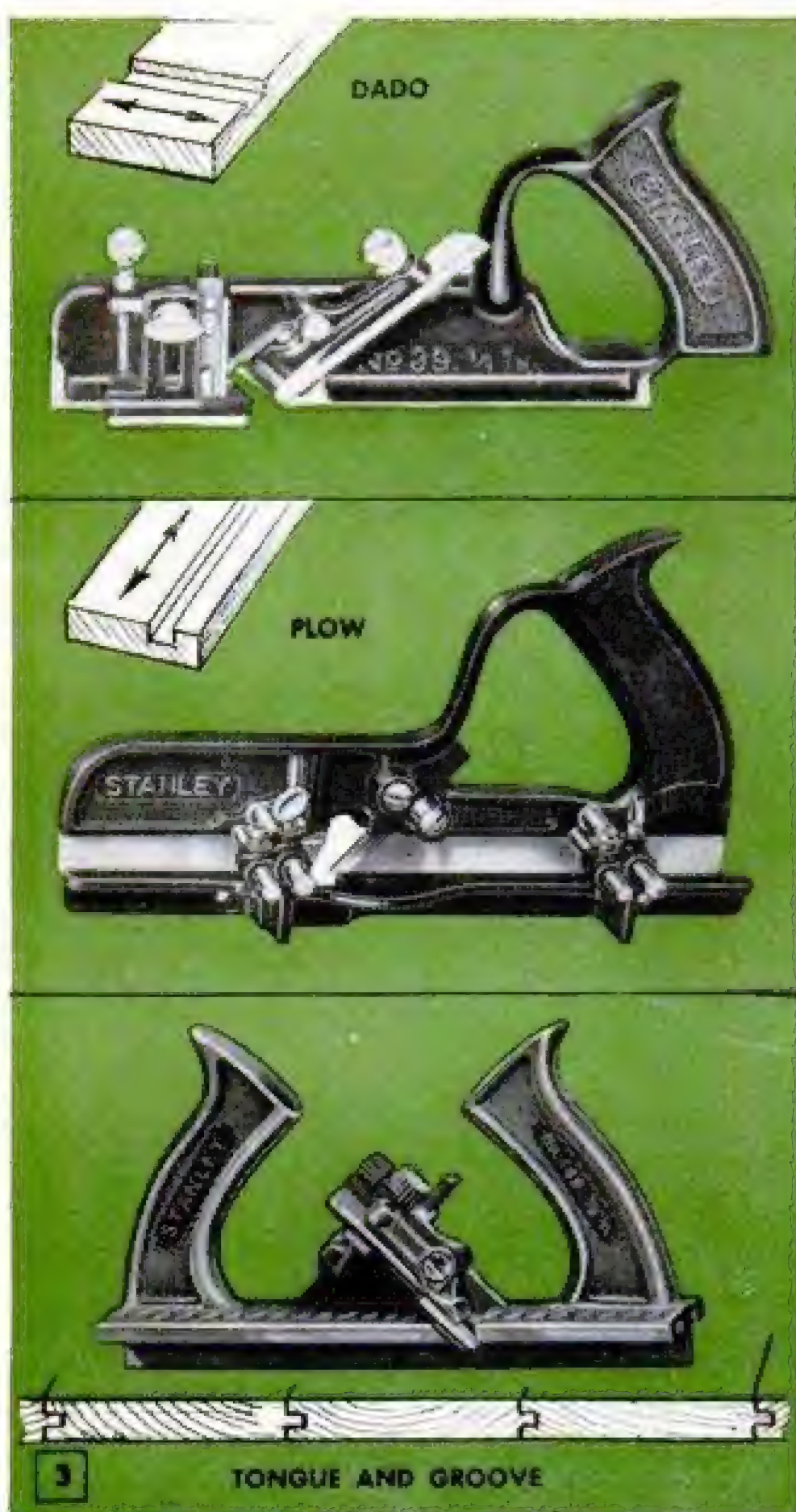
**S**PECIAL-PURPOSE PLANES do unusual jobs for which ordinary planes are not designed, and their cost is low compared to that of motorized planes for the same work. A typical job for special-purpose planes is the making of lip-type cabinet doors and drawers involving rabbets and grooves. They are indispensable for the installation of weather stripping, and are the best hand tools for shaping various types of moldings. The basic technique of handling planes and the methods of adjusting and sharpening blades, described in "Plane Know-How" in the May issue, also applies to special-purpose planes.

**Rabbeting:** Figs. 1 and 2-A show a regular plane for cutting rabbets. Its blade extends flush with the side of the body so the plane can descend into the cut. The duplex type, Fig. 2-A, has two blade seats; one for regular work and the other at the toe for bull-nose work—such as working close to the end of stopped rabbets, after which it is a simple matter to square the end of the cut with a chisel. An adjustable knifelike spur is provided ahead of the blade for use when rabbeting across the grain. The spur makes an advance cut in line with the edge of the blade and slightly deeper, to assure a clean-cut edge. An adjustable fence controls the width of the rabbet and assures a cut square with the side of the work. There is also an adjustable depth stop.

Small one-hand rabbeting planes, either regular or bull-nose type, detail B, are designed for accurately finishing rabbets that already have been cut to approximate depth. They are handy for relieving the binding of cabinet doors when the binding occurs on the bottom of the rabbet. No fence







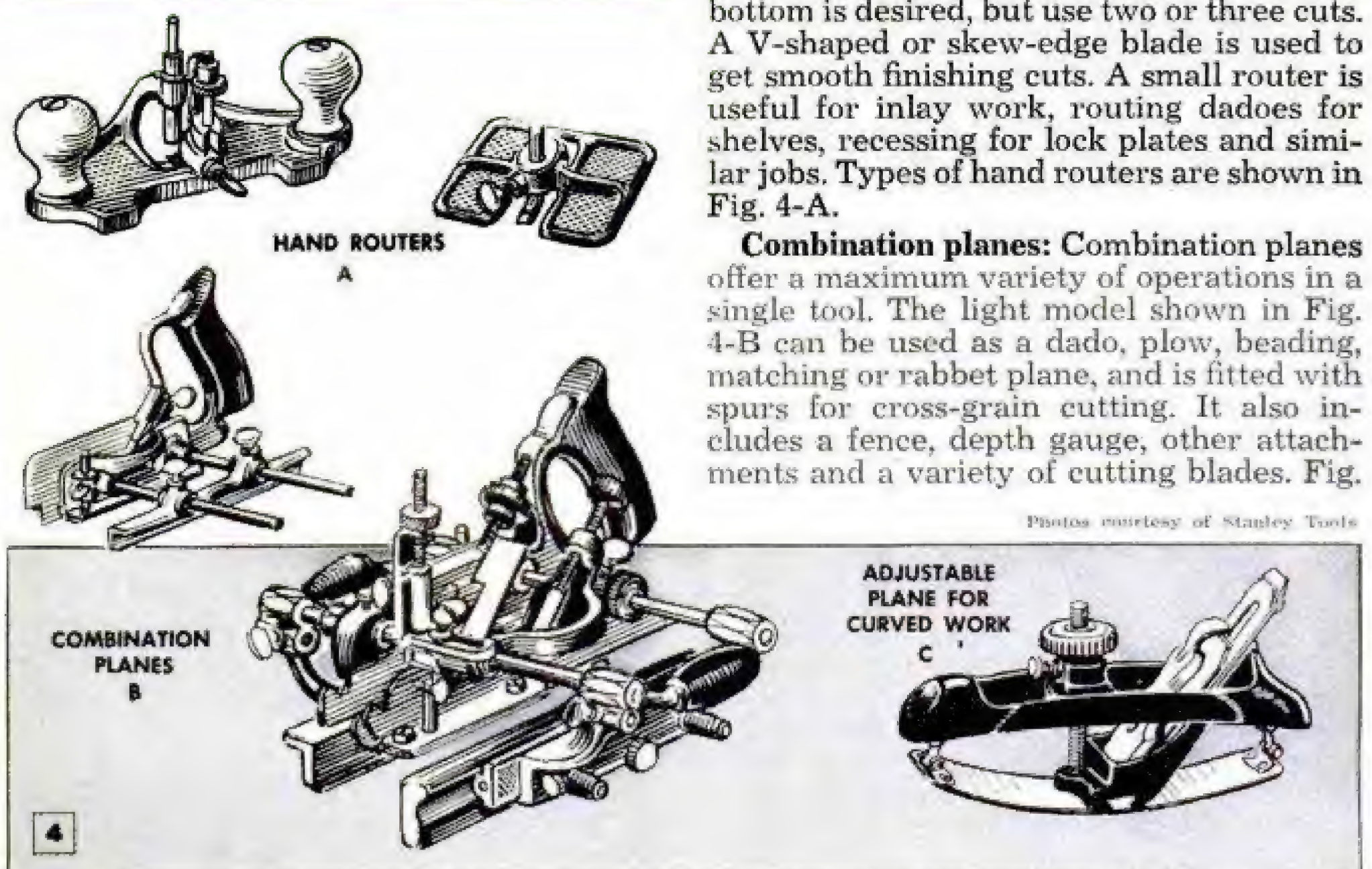
or depth gauge is provided. In an emergency these small planes can be used to cut the entire rabbet. Detail C shows how a strip of wood can serve as a fence; details D and E show wood tacked or clamped to the edge of the work as a guide.

**Dado and plow planes:** Planes for cutting square grooves have narrow runner-shaped stocks or bottoms that can descend into the cut. A dado plane is used for cutting grooves across the grain. It has a skew blade, usually  $\frac{1}{2}$  or  $\frac{3}{4}$  in. wide, two adjustable spurs to assure clean-cut edges and is fitted with a depth gauge. A straightedge clamped across the work helps to start the cut straight. A plow plane for cutting with the grain usually has a set of interchangeable blades from  $\frac{1}{8}$  to  $\frac{3}{8}$  in. wide, an adjustable fence and a depth gauge. A tongue-and-groove matching plane has two blades, one to cut a tongue and the other to cut a matching groove. The blades are located on opposite sides of a fence which extends along the center of the bottom. These three types of planes are shown in Fig. 3.

**Router planes:** The sides of a dado can be cut with a saw in a miter box, and the waste wood between the cuts removed with a router plane. This tool may have an open throat which can be closed for narrow work. It has two blade seats, one for regular work and the other for bull-nose work. A fence may be attached to follow the bottom edges of a cut on either straight or curved work. To bridge spans wider than the tool, an extra wooden bottom can be attached. Don't attempt to remove the waste to its full depth with a single cut when routing if a smooth bottom is desired, but use two or three cuts. A V-shaped or skew-edge blade is used to get smooth finishing cuts. A small router is useful for inlay work, routing dados for shelves, recessing for lock plates and similar jobs. Types of hand routers are shown in Fig. 4-A.

**Combination planes:** Combination planes offer a maximum variety of operations in a single tool. The light model shown in Fig. 4-B can be used as a dado, plow, beading, matching or rabbet plane, and is fitted with spurs for cross-grain cutting. It also includes a fence, depth gauge, other attachments and a variety of cutting blades. Fig.

Photos courtesy of Stanley Tools





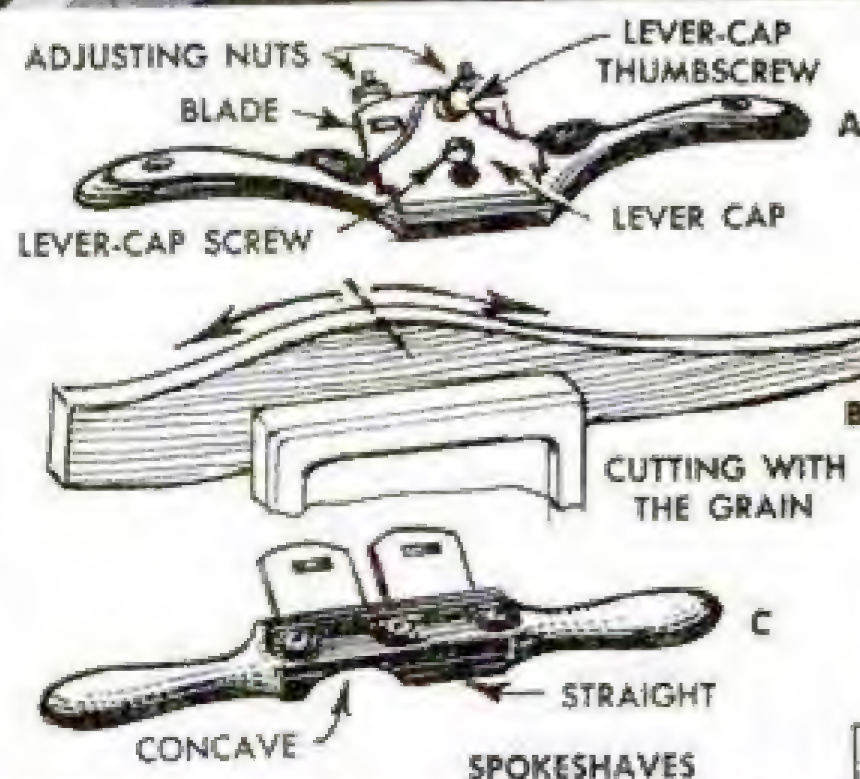
4-B also shows a heavier model that will do all the work of the lighter one, plus cutting molding shapes. Many shapes of cutting edges are available, or they can be ground from blanks.

**Circular planes:** Shown in Fig. 4-C, a circular plane has a flexible steel bottom. A vertical screw at the center varies the radius of the bottom for planing either concave or convex surfaces. The blade and lever-cap assembly is similar to that of a regular jack plane, which assures smooth, clean cutting without chatter.

**Spokeshaves:** Concave or convex edges are usually smoothed with a spokeshave, Figs. 5 and 6-A. One with a flat bottom is used for long curves, and one with a convex bottom is best for concave curves of small radii. The blade of a spokeshave is adjustable and is sharpened like a regular plane iron. Usually a spokeshave is pushed forward but it also can be pulled. Care must be taken to cut with the grain of the wood, especially on reverse curves, Fig. 6-B. A model having two blades, one straight and one convex, detail C, is also available.

**Scrapers:** Final smoothing of fine woodwork prior to sanding is done with scrapers such as shown in Fig. 7. These remove the ridges left by machine or hand planing. Scrapers cut thinner shavings than planes, and will cut smoothly against the grain. Veneered surfaces are not planed, but should be smoothed by scraping. A cabinet scraper, detail A, resembles a spokeshave. Details B and C show hand scrapers for straight and curved surfaces. Scrapers like the one in detail D are handy for floor work, for getting into corners when removing paint and varnish, and for dressing down ridges caused by warped floor boards. This one has a coil spring in the head assembly which serves as a cushion and eliminates chatter. A couple of small scrapers of the kind shown in details E and F should be in every homeowner's tool kit. Scrapers are used with two hands, Fig. 8. Hold a cabinet scraper like a spokeshave, detail A, a hand scraper with the fingers, details B and C, and a floor scraper as in detail D. Hand and cabinet scrapers may be either pushed or pulled, the blade being inclined at an angle of 75 deg. to the work surface in the same direction as it is moved, detail E.

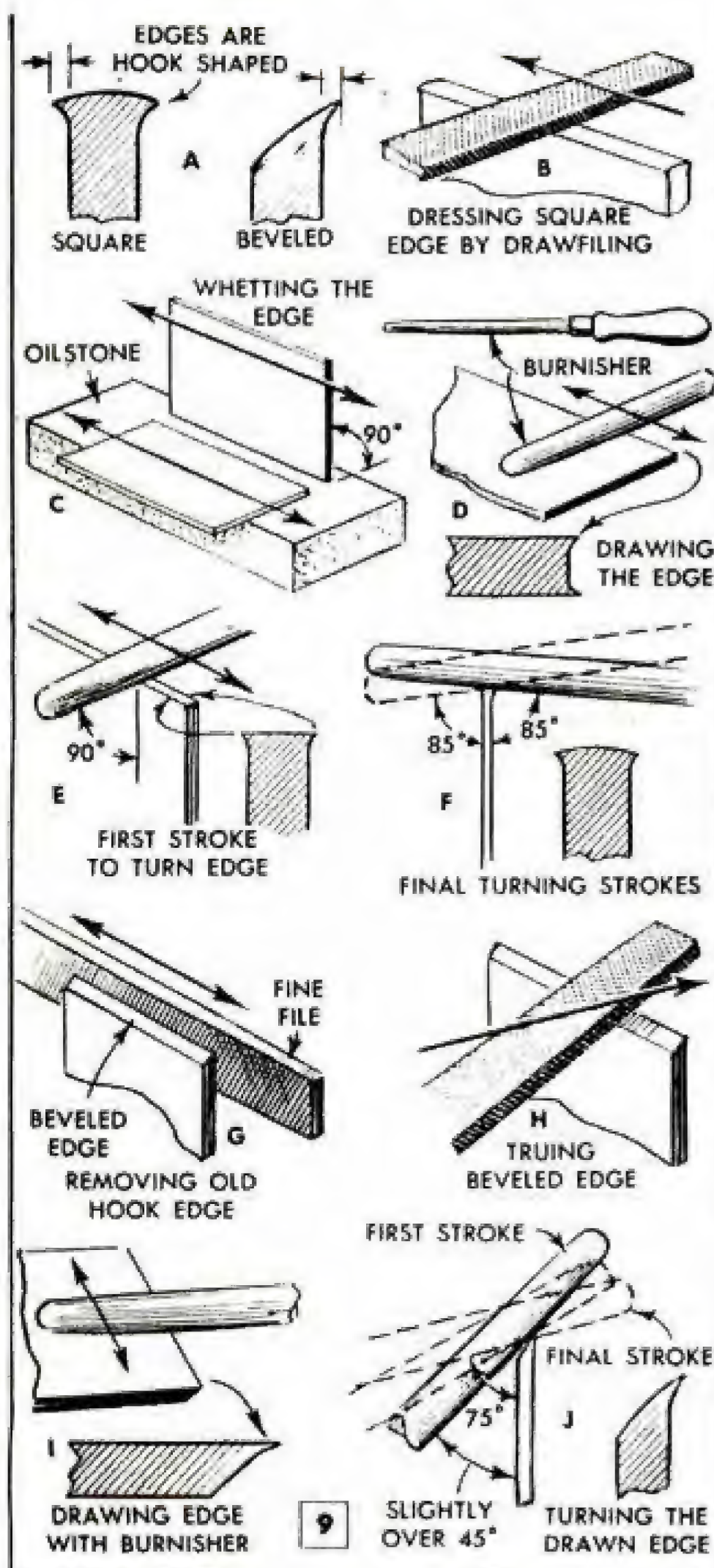
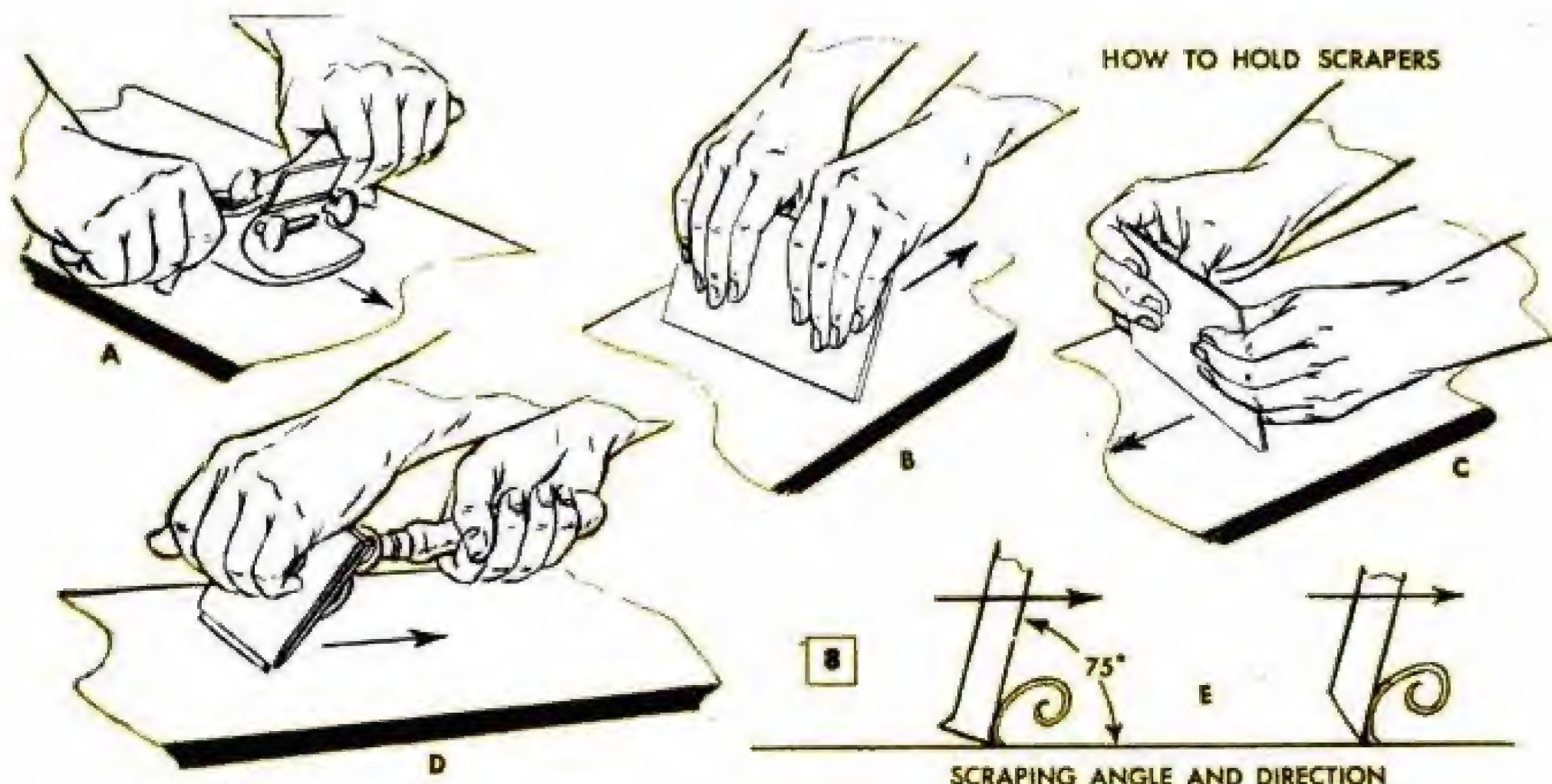
**Cutting edges of scrapers:** Fig. 9 shows how the cutting edges of scraper blades are made slightly hook-shaped by burnishing. Detail A shows square and beveled blades. Hand scrapers have square, double-cutting blades. Blades cut best when the center is bowed slightly toward the leading edge. On cabinet scrapers this is done by means of a tension screw. On hand scrapers pulled as in Fig. 8-B, the blade is bowed by the index fingers exerting more pressure at the center



#### SCRAPERS







of the blade. When the blade is pushed, it is bowed by pressing with the thumbs at the center while pulling the edges with the fingers, Fig. 8-C.

**Sharpening scrapers:** Scraper blades must be resharpened and burnished frequently to assure clean, smooth work. When they produce dust instead of shavings, they need sharpening. To sharpen a square-edge scraper blade, proceed as follows: (1) Drawfile the edge square and straight with a fine mill file, Fig. 9-B; (2) Whet the edge on an oilstone, keeping the blade at right angles to avoid rounding the edges. Remove the burr by rubbing the flat sides of the blade on the stone so that the edges become very sharp. See detail C. (3) Use a burnisher (a smooth, hardened-steel rod), firmly stroking the blade with the burnisher held flat against its sides as in detail D. Three or four strokes will draw the edges as indicated in the detail. (4) Start turning the drawn edges by stroking the burnisher over the edge of the blade, the first stroke at 90 deg. as in detail E, and the following ones at 75 deg., detail F. For beveled scraper blades the sharpening process is as follows: (1) Use a fine mill file on the side of the blade to remove the old hook edge, detail G. (2) Dress down the beveled edge, which should be 45 deg., until it is straight and without nicks. Strokes should be crosswise and toward the edge as shown in detail H. (3) Whet the beveled edge to a fine finish and remove the burr. (4) Firmly stroke the burnisher three or four times along the flat edge of the blade to draw the edge, detail I. (5) Rub the burnisher along the edge to turn it as in detail J, holding the burnisher at a slightly greater angle than the 45-deg. blade angle, and increasing the angle gradually on succeeding strokes until the last one is 75 deg.

★ ★ ★

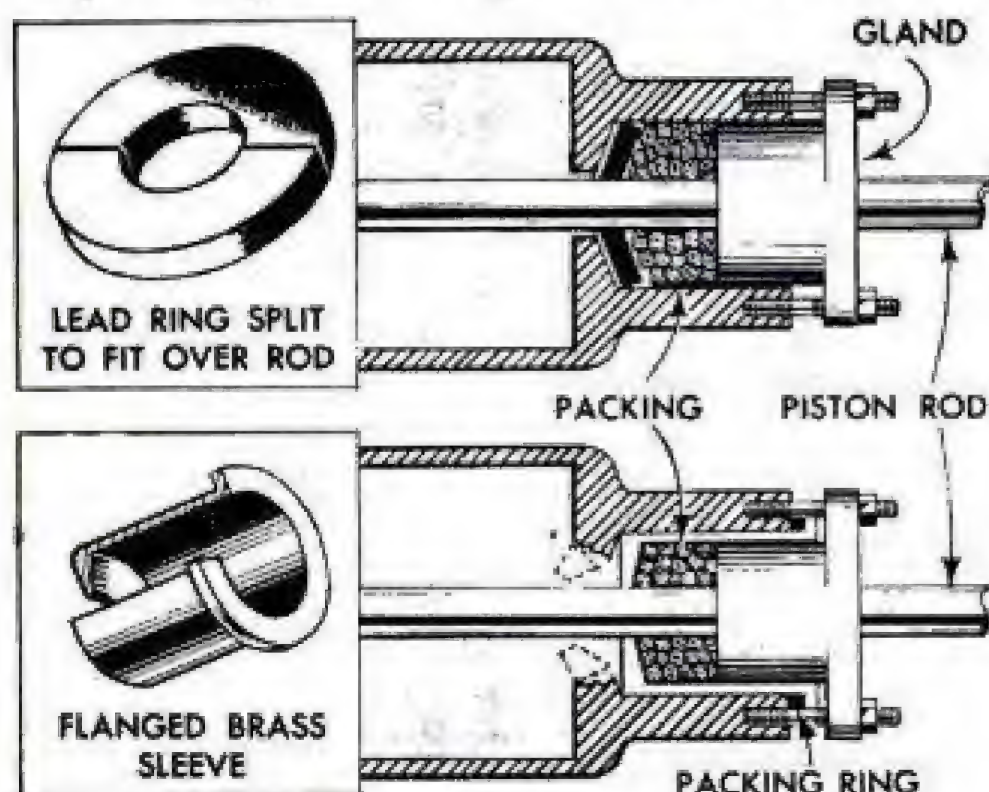


## Fork-Lift Truck Used for Maneuvering Automobiles Into Parking-Lot Stalls

In one parking lot, a fork-lift truck is used for parking cars and for jockeying cars parked in the runways into stalls as they are emptied. This was made possible by mounting an angle-steel cradle to pivot on a bracket that slips over the ends of the forks. In use, the cradle is hooked beneath the front bumper of a car, after which the front end is raised for maneuvering the car where desired.



## Repairing Stuffing-Gland Seat on Steam-Engine Cylinders



Frequently the stuffing glands on cylinders of steam engines and compressors will wear to the point where the packing pushes through and causes constant trouble. This can be prevented by splitting a lead ring of the proper size, fitting it over the piston rod and driving it tight against the seat. The ring will effectively stop the leak but will not cause the rod to wear. If wrenching on the stuffing gland has fractured the seat, make a brass seat with an inner and outer flange as shown in the lower detail. Place a packing ring under the rear of the outside flange and the rod packing inside as usual. Tightening of the gland will make both packings tight.

## Rewired Car Heater Operates Only When Generator is Charging

Whenever a car engine is idling or operating at low speeds, the generator stops charging and permits the entire electrical load of the car, such as the heater, radio, headlights, etc., to come from the battery. To alleviate this condition somewhat, I rewired the heater and the defroster-blower motors, both of which require considerable current, to the generator terminal on the regulator.

As a result of this, they now operate only when the generator is charging. This has raised the average level of the battery charge, while the reduction in hot air has not been noticed. An additional advantage of the arrangement is that the blower no longer draws in the exhaust fumes of the car ahead while waiting at a stoplight.

J. E. King, College Park, Md.

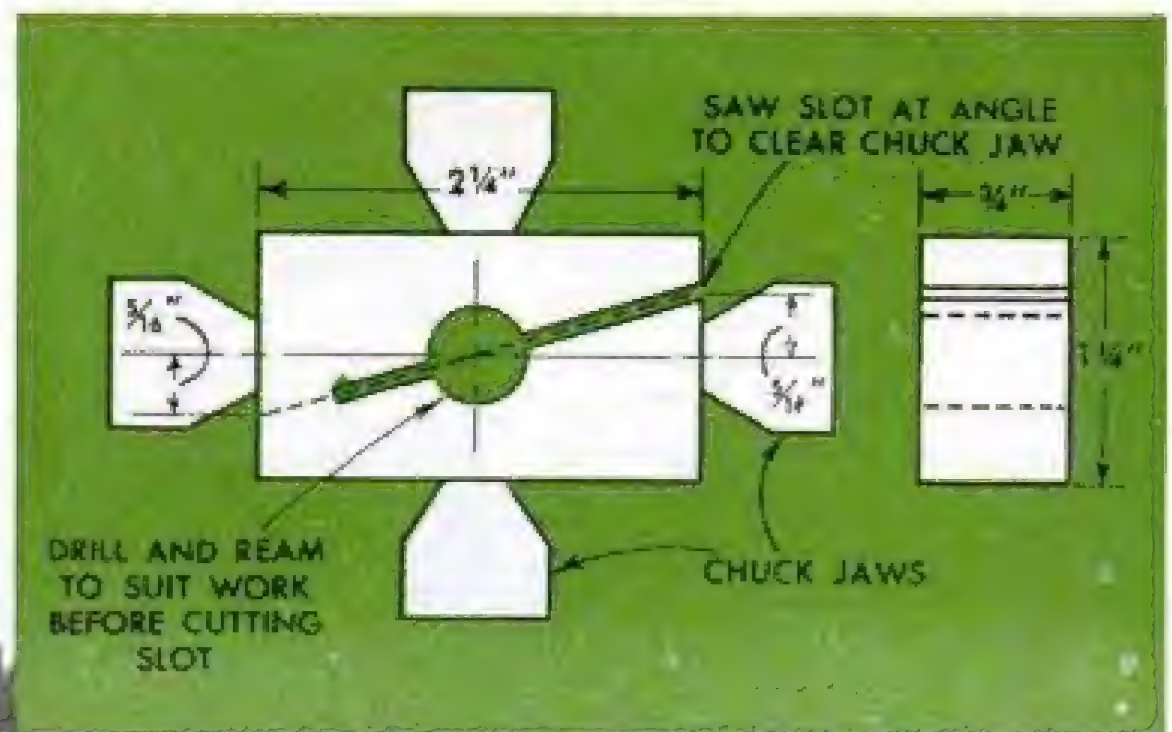
## Tomato Spoilage in Home Garden Prevented by Improvised Racks

When left in contact with the damp earth, ripening tomatoes eventually will rot on the vines or are damaged by worms and insects. In most cases this can be prevented by shoving planks under overhanging portions of the plants and raising them on bricks or wooden blocks so the plants are supported off the ground.

☛ Beeswax can be used as a lubricant when tapping or turning brass, copper, aluminum and other similar metals.







## COLLET FOR 4-JAW CHUCK

By C. W. Woodson

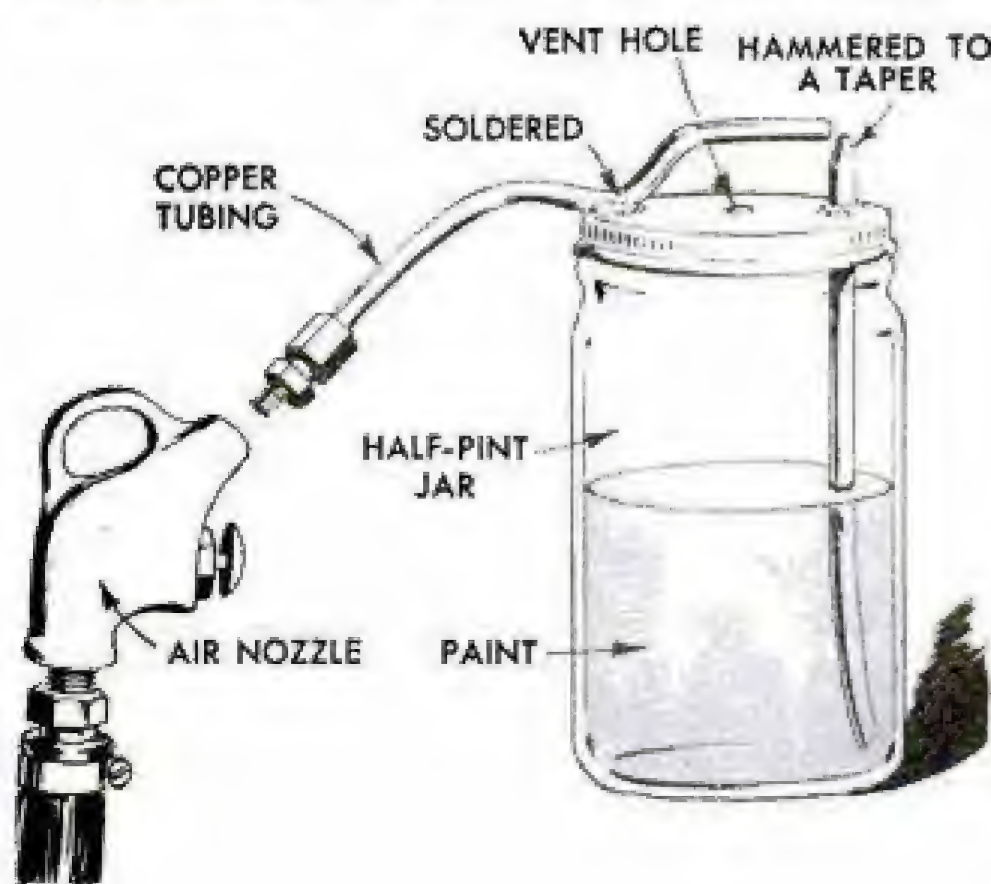
To speed up a repetitive job requiring shouldering and cutting-off operations on small-diameter rods, one machinist in a job shop came up with this collet for use in a 4-jaw chuck. It's simply a rectangular piece cut from  $\frac{3}{4} \times 1\frac{1}{4}$ -in. tool steel and center-drilled to the diameter of the rod to be machined. After drilling, the collet is slotted diagonally to a point about  $\frac{3}{8}$  in. beyond the center hole. Although none is shown, a chip-clearance hole can be drilled at the stopped end of the slot if desired. In use, the collet is centered and locked in position with three chuck jaws. Then the rod is passed through the collet and the upper chuck jaw tightened.

## Interchangeable Jars for Spray Gun Hold Variety of Colors

The owner of a repair shop where a large variety of paint colors was used, but only in small amounts, found this spray gun ideal. Small salad-dressing jars were used on the gun, which made it possible to store the paint right in them. Whenever a certain

color or shade was needed, it was just a matter of selecting and screwing the jar to the gun. Cleaning consisted only of rinsing the small vacuum tube in paint solvent. The end of the air tube is closed with a drop of solder and filed square. Then it is center-drilled with a No. 60 drill. The small hole concentrates the air stream directly over the end of the vacuum tube. Adjust the air tube by bending it slightly near the end until a smooth, round spray pattern is produced on the work.

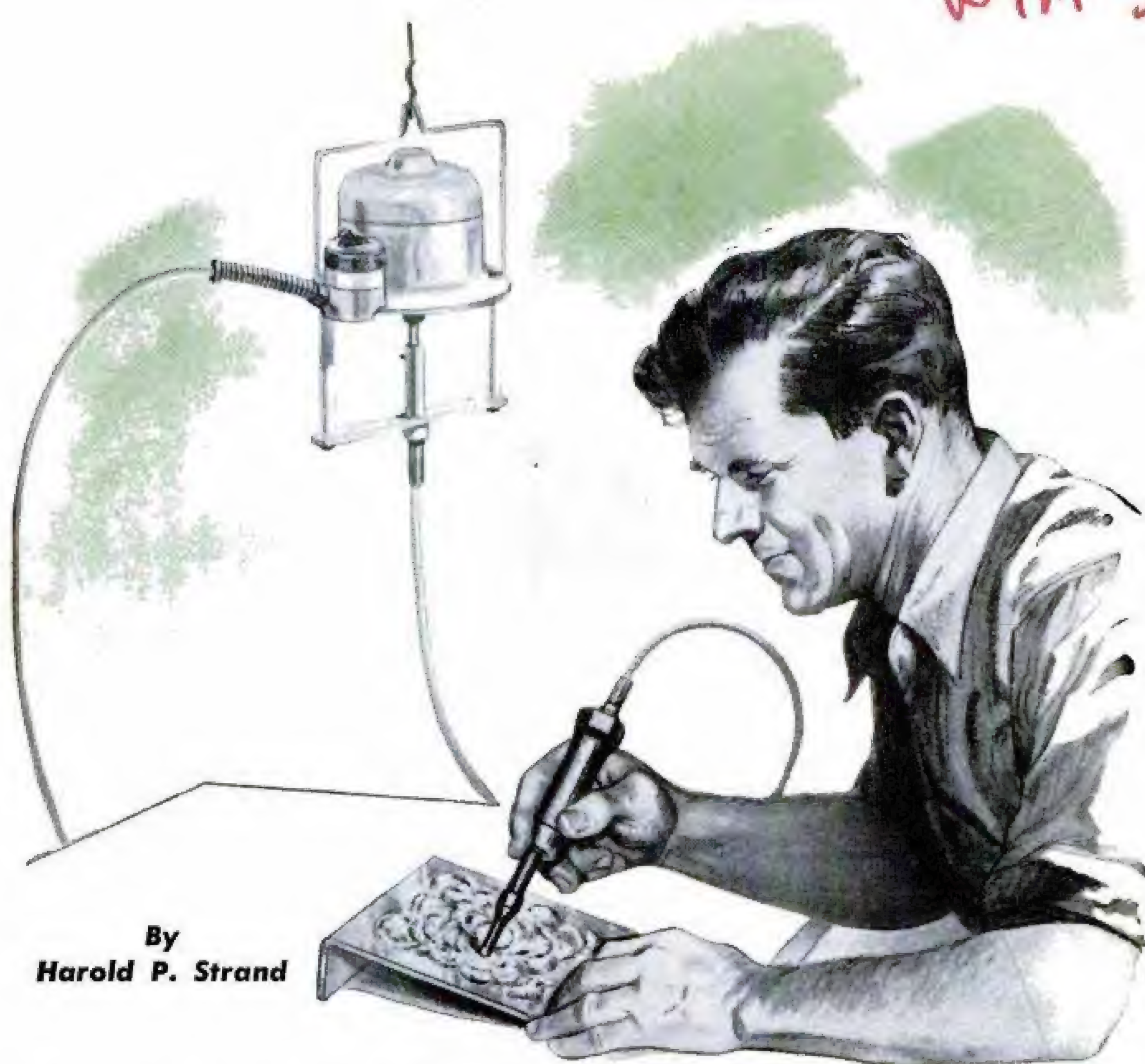
Richard Somerville, Corona, Calif.



## Potato Peeler Strips Insulation

Electricians using plastic or rubber-covered wire of the heavier gauges sometimes find it difficult to strip the insulation with regular tools. One electrical company experimented and found that the old-style potato peeler, with its slotted center and facing knives, seemed more effective than electrician's wire strippers for removing this insulation.—L. Cleary, Grosse Ile, Mich.





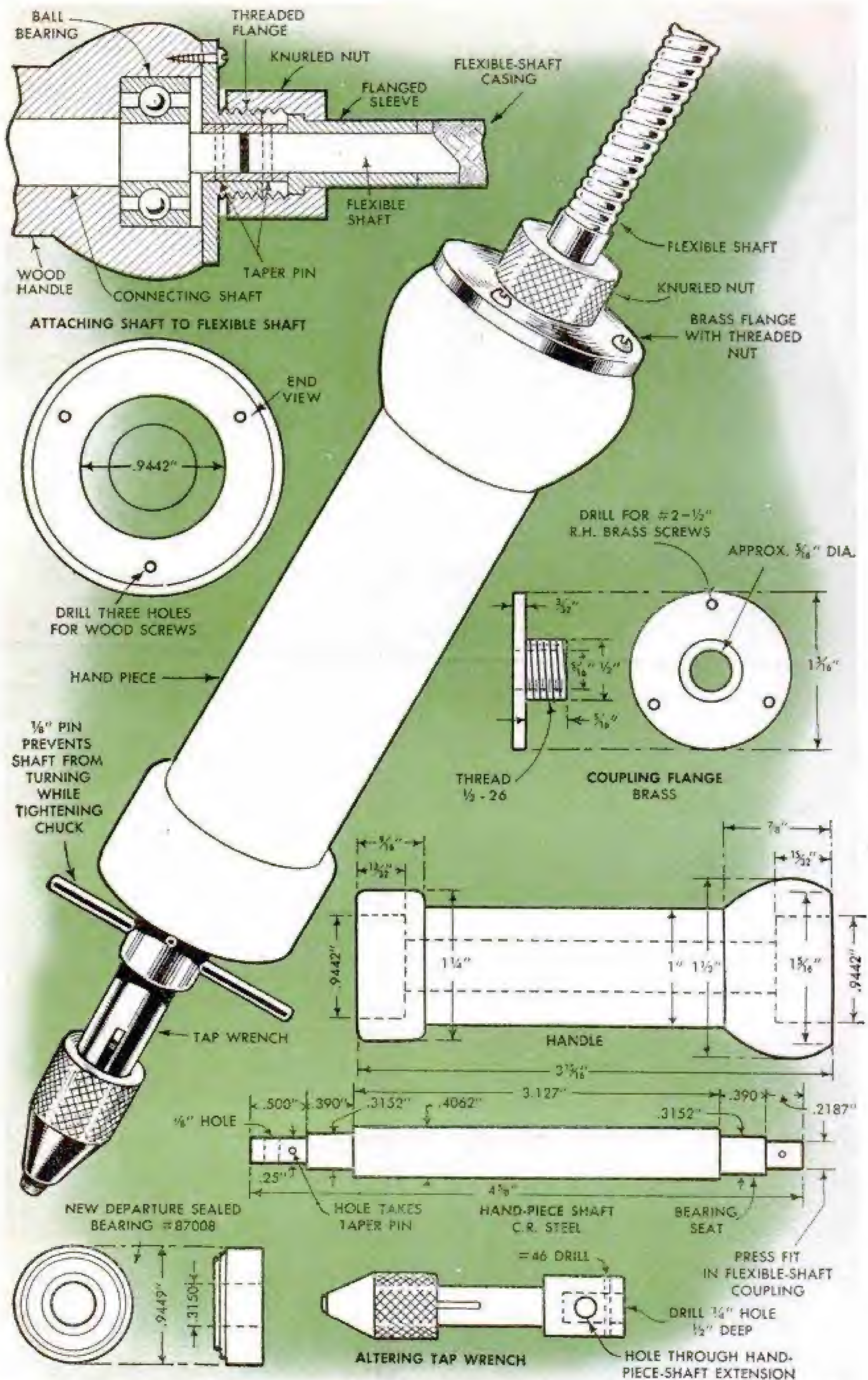
By  
Harold P. Strand

## Vacuum-Cleaner Motor Drives FLEXIBLE-SHAFT TOOL

**F**EATUREING a hanging drive unit that incorporates a motor taken from an old vacuum cleaner, this handy flexible-shaft carving tool can be assembled for practically nothing from common materials found in the average home shop. The motor used in the original was taken from an old Hoover vacuum cleaner which has a toggle switch already mounted on its base. No changes need be made in the motor itself. It is suspended in a frame of  $\frac{1}{8}$ -in. soft-iron or steel wire, as shown in the drawing, and the support bar for the flexible shaft is mounted below it by means of long 10-32 stove bolts inserted through pipe spacers. The supporting bar is a piece of cold-rolled flat steel in which a hole is tapped in the center for a flanged brass bushing to which

the coupling flange of the flexible shaft is attached. The size of this bushing will depend on the flexible shaft at hand. The flexible shaft can be purchased with a shaft the same size as that of the motor, but should the shaft be smaller, a reducing coupling, turned from brass stock as detailed on page 205, is used. This piece is fastened to the motor shaft with a hollow setscrew. The male extension at the other end is a press fit in the flexible-shaft coupling, where it is locked with a small taper pin. The hole in the flanged bushing is reamed to clear this coupling. With the parts in position and lined up properly, the pipe sleeves are cut to the required length and the supporting bar is secured to the wire motor hanger. It should be





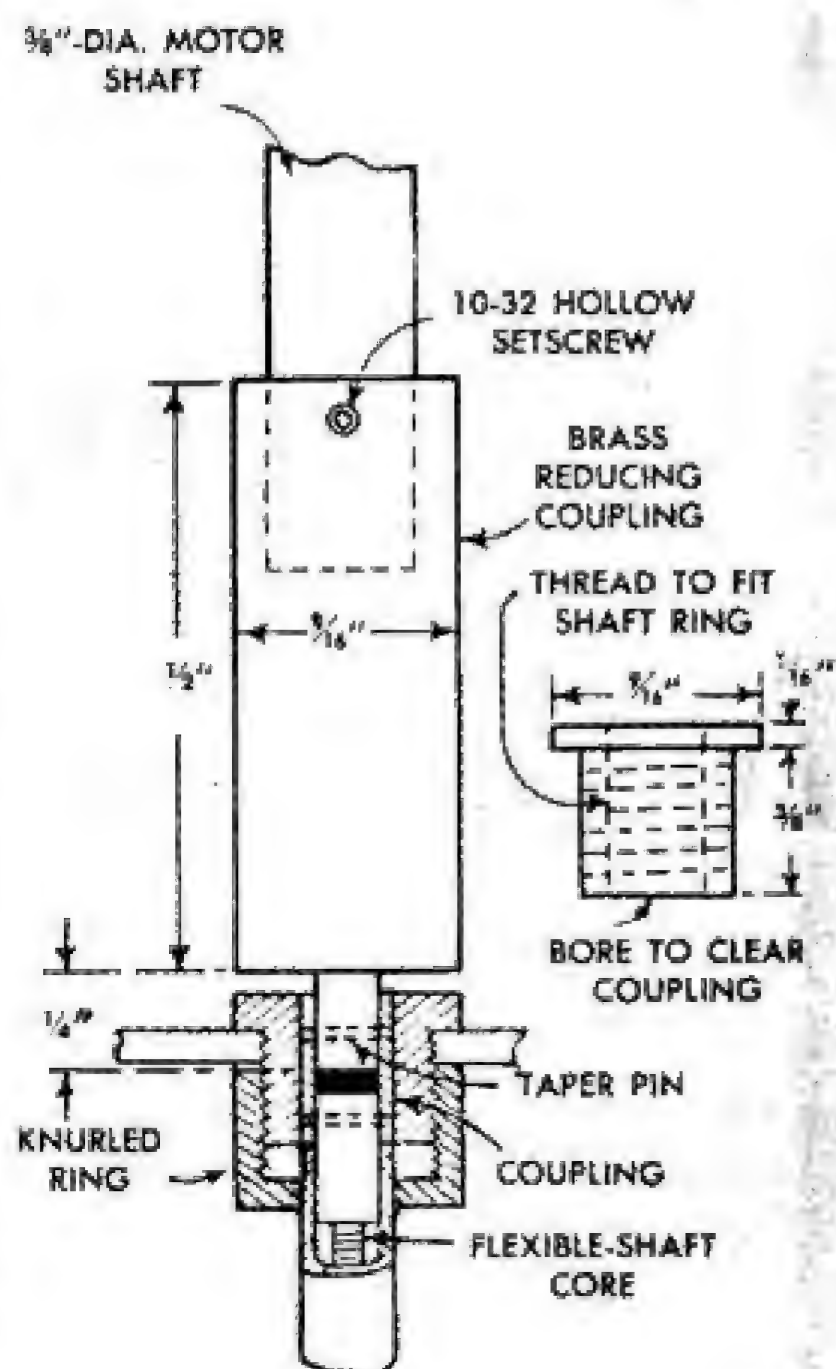
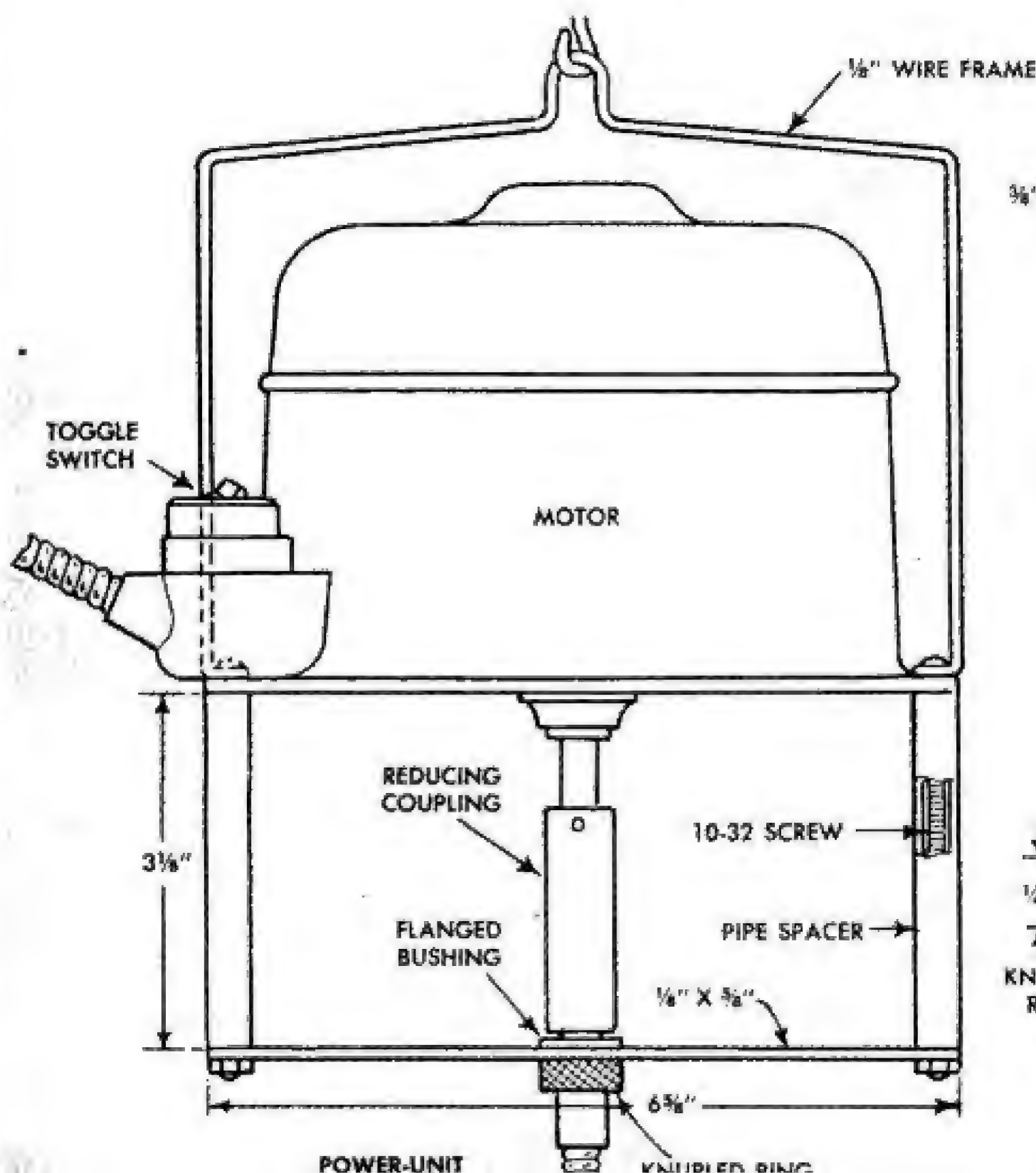


remembered that the fittings for coupling the shaft and the motor will vary, depending on the type of flexible shaft you use.

Next the hand piece is constructed. It consists of a shaped hardwood handle, a steel shaft, two sealed ball bearings, a threaded coupling flange and an altered tap wrench to serve as a chuck. If you don't have a wood-turning lathe in your shop, the handle can be turned in a small metal lathe by pressing a short  $\frac{3}{8}$ -in. shaft into a drilled hole in one end of the block and chucking the shaft. The other end of the work is supported in the tailstock center. The machine feed can be used with close-grained hardwoods, such as birch or maple, and final turning to shape can be done by working the feeds by hand. Better yet, clamp a temporary tool rest to the front of the lathe bed and use wood-turning chisels. The picture at the top of the page shows how the ball-bearing seats are counterbored in each end of the hand piece to receive the bearings as a press fit. The hole through the center of the hand piece is  $\frac{7}{16}$  in. in dia., to clear the shaft. The shaft is turned from cold-rolled steel to the dimensions given in the drawing on page 204. The coupling flange is turned from brass to the size given and threaded to take the knurled nut of the flexible shaft. After the flexible shaft has been pinned to the sleeve, it is inserted in flanged bushing. Then the shaft with the bearing in place



is also pinned to the sleeve, the knurled nut is tightened and the shaft is inserted in the handle. Finally, the flange is secured to the handle. The chuck is made by altering a small tap wrench as shown. The original T-handle is removed, a blind hole is centered and drilled in the end of the head and the chuck is secured to the shaft with a taper pin. This must be accurately drilled so that the chuck will turn true. Using the original hole in the head of the wrench as a guide, a  $\frac{1}{8}$ -in. hole is drilled through the hand-piece shaft. A pin temporarily inserted in this hole prevents the shaft from turning while the chuck is tightened. If desired, a small drill chuck can be used in place of the altered tap wrench. ★ ★ ★



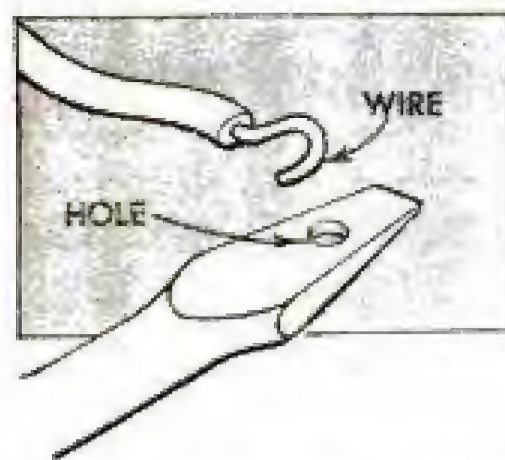


## Handy Self-Locking Post Puller Made From Flat Steel



Pivoted to a triangular base made of flat or angle steel, this self-locking fence-post puller consists of a 10-in. link having two pins extending from the side to grip the post that is pivoted to the end of a lever. Both the link and lever also are made of flat steel. The pins may be welded to the link or may be short bolts inserted through holes drilled in the link. The pins are spaced just far enough apart to allow them to slip over the post when the link is held horizontally, but which will grip it securely when the link is drawn up at an angle.

## Hole in Screwdriver Blade Aids Forming Wire Eyes



One electrician found that a small hole drilled in the blade of a screwdriver simplified making eyes on the ends of electrical wires. He inserts the wire in the hole and ro-

tates the handle of the screwdriver to form a hook on the end, thus eliminating the need for a long-nose pliers. The wire is then ready for fitting over the terminal post.

## Dust Cloth Knotted at Corner For Tucking Into Rule Pocket

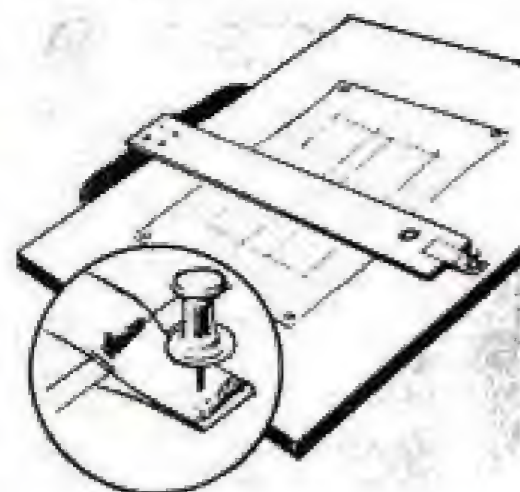
To keep a dust cloth handy while at the same time leaving his hands free for other work, a janitor ties a large knot in one corner of the cloth and inserts it in the rule

pocket of his overalls. Fitting the pocket snugly, the knot serves to support the rest of the cloth which is allowed to dangle.

G. E. Hendrickson, Argyle, Wis.

## Tape Tab on End of T-Square Permits Tacking to Board

Artists who use a T-square as a hand rest when lettering, can prevent the square from slipping by attaching a tab to the end through which a thumbtack is forced into the drawing board. A



strip of tape two or three in. long is folded in the center and the ends applied to both sides of the square as shown. The remainder then is pressed together to form the tab.

## Folded Slip Keeps Sheets Aligned For Insertion in Typewriter

To save time when inserting several sheets of paper and carbons in a typewriter, I fold a slip of paper over the top edges to help guide them around the roller. The slip is removed after it clears the machine, leaving the sheets perfectly lined up for typing.

Victor H. Lamoy, Upper Jay, N. Y.

## Paper Cup Serves as Jig When Soldering Wires

A jig for holding wires that are to be soldered together can be made from a paper drinking cup. A 1/2-in. slit is cut in the lip of the cup for each wire to be included in the splice, and the tips of all the wires brought together over the center as shown. This will leave the hands free for handling the solder and the iron.





## Mobile Water Tank Simplifies Filling of Stock Waterers

This mobile 500-gal. water tank is elevated several feet above its chassis to simplify filling stock water tanks in the field. Of welded sheet-steel construction, the tank is filled by pump or windmill and emptied by means of a quick-release valve fitted in one end as shown. A shutoff valve is located just ahead of the quick-release valve to prevent complete loss of water should cattle open the latter by rubbing against it. The tank, which is fitted on top with a center hoisting hook, rests in strap-steel slings welded to upper ends of the channel-steel support. These, in turn, are welded to the chassis. The chassis is assembled from the rear axle and drive-shaft housing from an old car, and a Model-T Ford



front axle with a channel-steel bolster welded to the spring pads is used for the front end. The drive-shaft housing serves as the reach of the chassis, while steel angle is used for bracing members.

L. H. Houck, Jefferson City, Mo.

## Pulley Hub Fitted With Washer to Stop Front-End Oil Leaks

Leaks in the front oil seal of an automobile engine can be stopped temporarily by installing a large washer inside the crankshaft-pulley hub. Loosen the heavy cap screw that holds the pulley hub and force the hub forward, being careful not to bend the chain cover or break the pulley. Slide the hub off the shaft and place a  $\frac{1}{8}$ -in. washer inside of it. Place the cap screw

through it and reinstall the pulley assembly. When tightened, the pulley will be  $\frac{1}{8}$  in. farther forward than originally, giving a new bearing surface for the oil seal. However, if this causes too much misalignment of the fan belt, remount the water pump with enough extra gaskets to equal the distance that the crankshaft pulley has been moved forward.

## Vacuum-Gauge Connectors Kept at Hand in Shop



Vacuum-gauge fittings will not be lost or mislaid in the shop, and will be kept at hand ready for immediate use, if five large cotter keys are soldered to the handle of the gauge to hold them, as shown in the illustration. The spring action of the cotter keys is great enough to hold the fittings securely. The two bushings which come with the set are best stored by screwing them to two of the fittings before the fittings are placed over the cotter keys. Whenever the gauge is to be stored, the presence of an empty key on the handle will immediately call attention to the fact that one of the fittings has been mislaid.

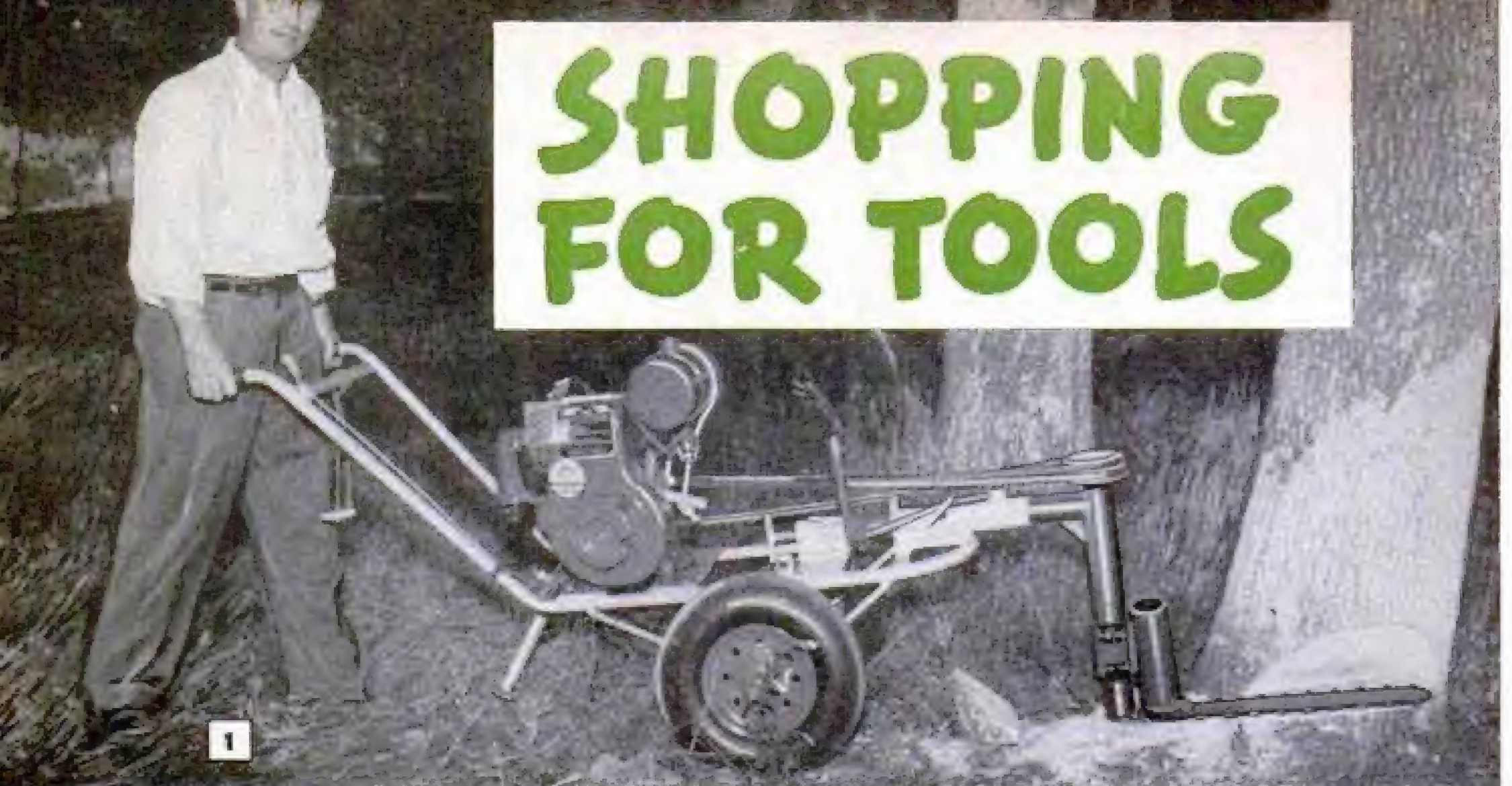
## Tobin Bronze Used for Brazing Extensions on Drills

Tobin bronze is superior to other metals for brazing an extension on a drill when greater length is required. The preparations consist of applying the bronze and filing or grinding off the surplus material, after

which it is polished with a fine emery cloth. Tobin bronze will give greater strength, due to its lower melting temperature which doesn't draw the temper of the drill or cause the drill to break.



# SHOPPING FOR TOOLS



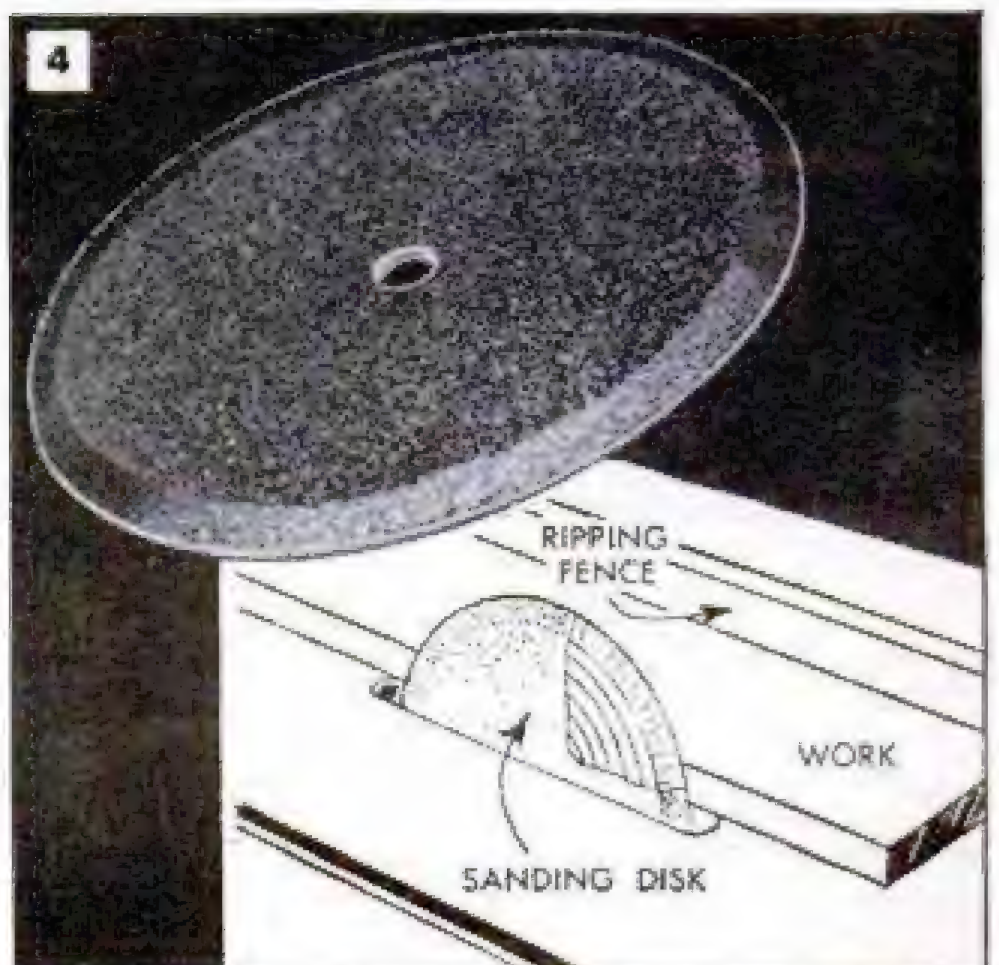
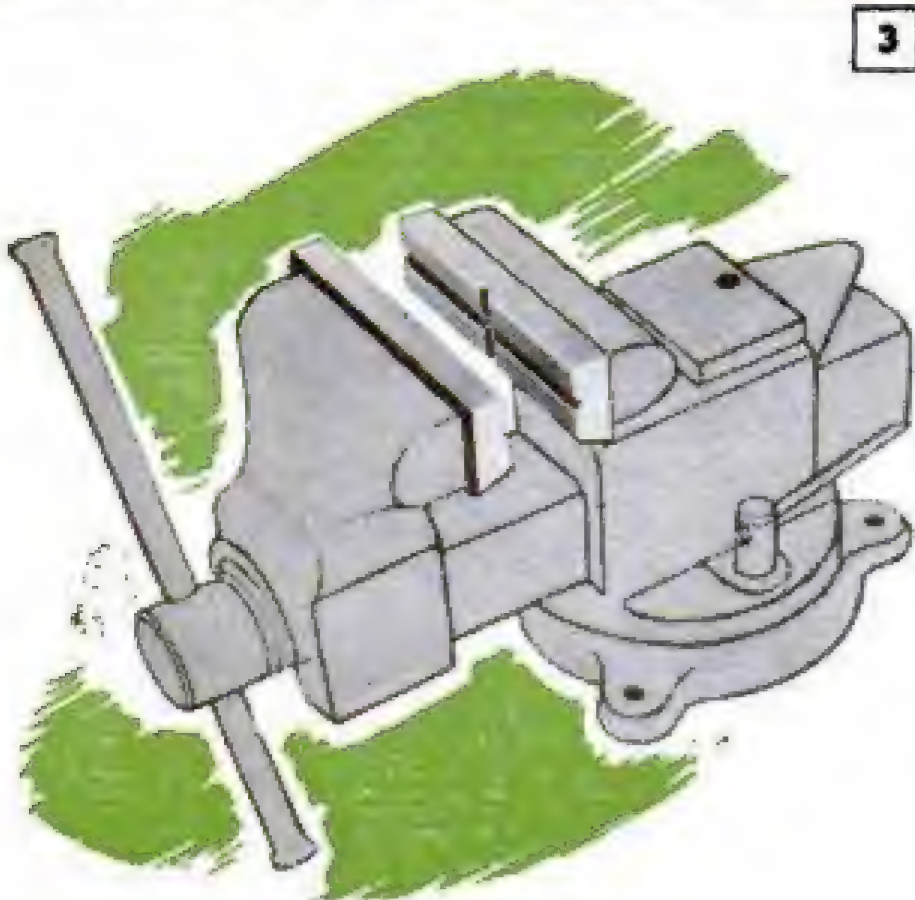
**1. CHAIN-SAW CONVERSION UNIT** fits most tree saws of the wheelbarrow type. Chain-saw drive sprocket fits lower end of saw mandrel, or arbor, and chain-saw bracket clamps to the arbor housing. Bracket contains oil reservoir for lubricating saw chain



**2. TWO-WAY DRILL GUIDE** positions the drill both vertically and laterally. A quadrant calibrated from zero contacts the work and the drill is squared laterally at a glance. A circular level on the saddle attached to drill body squares drill bit vertically

**3. SOFT VISE JAWS** have built-in permanent magnets that snap them into position instantly as auxiliary jaws on any common type of machinist's vise. Made from a soft alloy that won't scratch or mar highly polished surfaces. Available in sizes from 3 to 4½ in.

**4. BEVELED SANDING DISK** for use on circular-saw arbors enables operator to edge stock to precise width by passing it between the disk and ripping fence. Long bevels at edge of disk prevent tearing of abrasive when starting stock between fence and disk. Disks are made of aluminum; available in 8 and 10-in. dia.





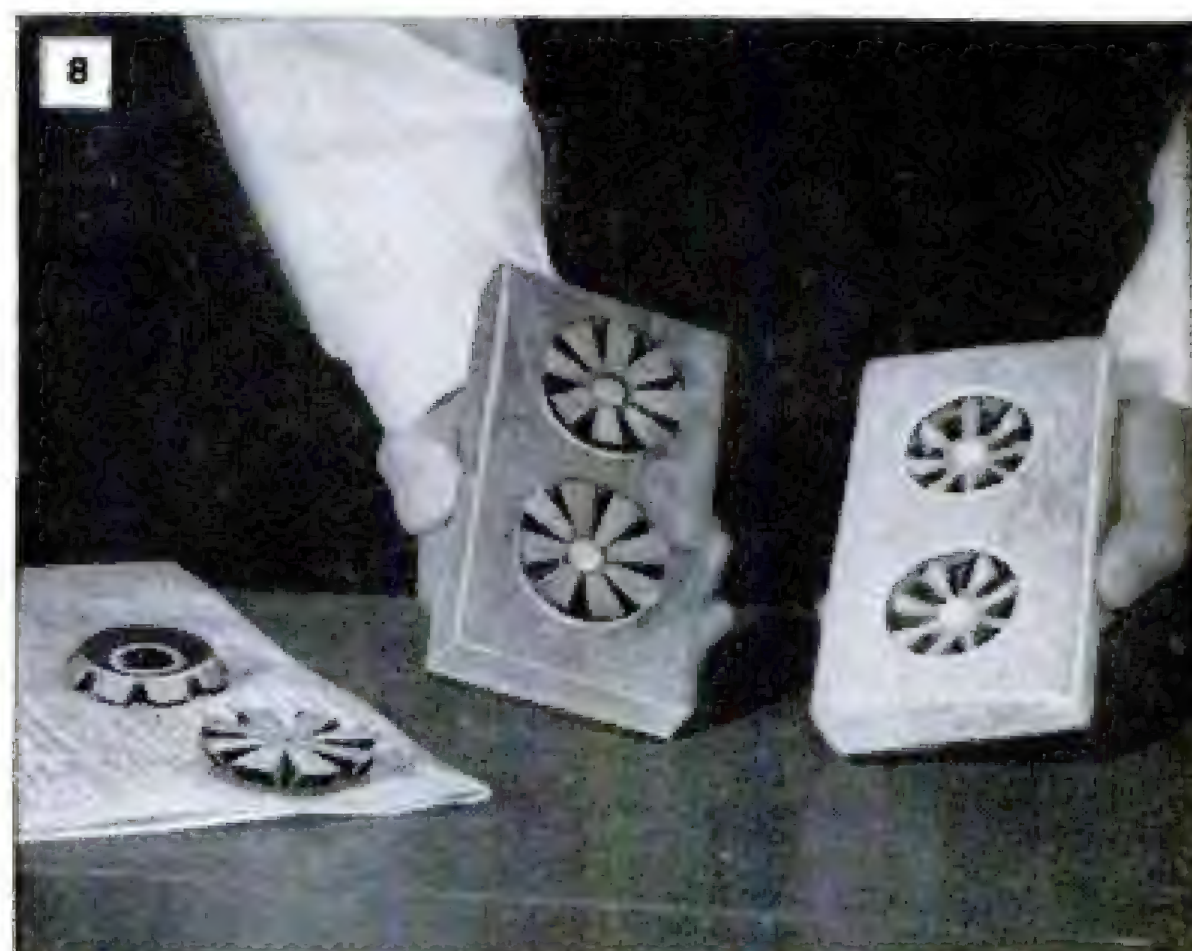
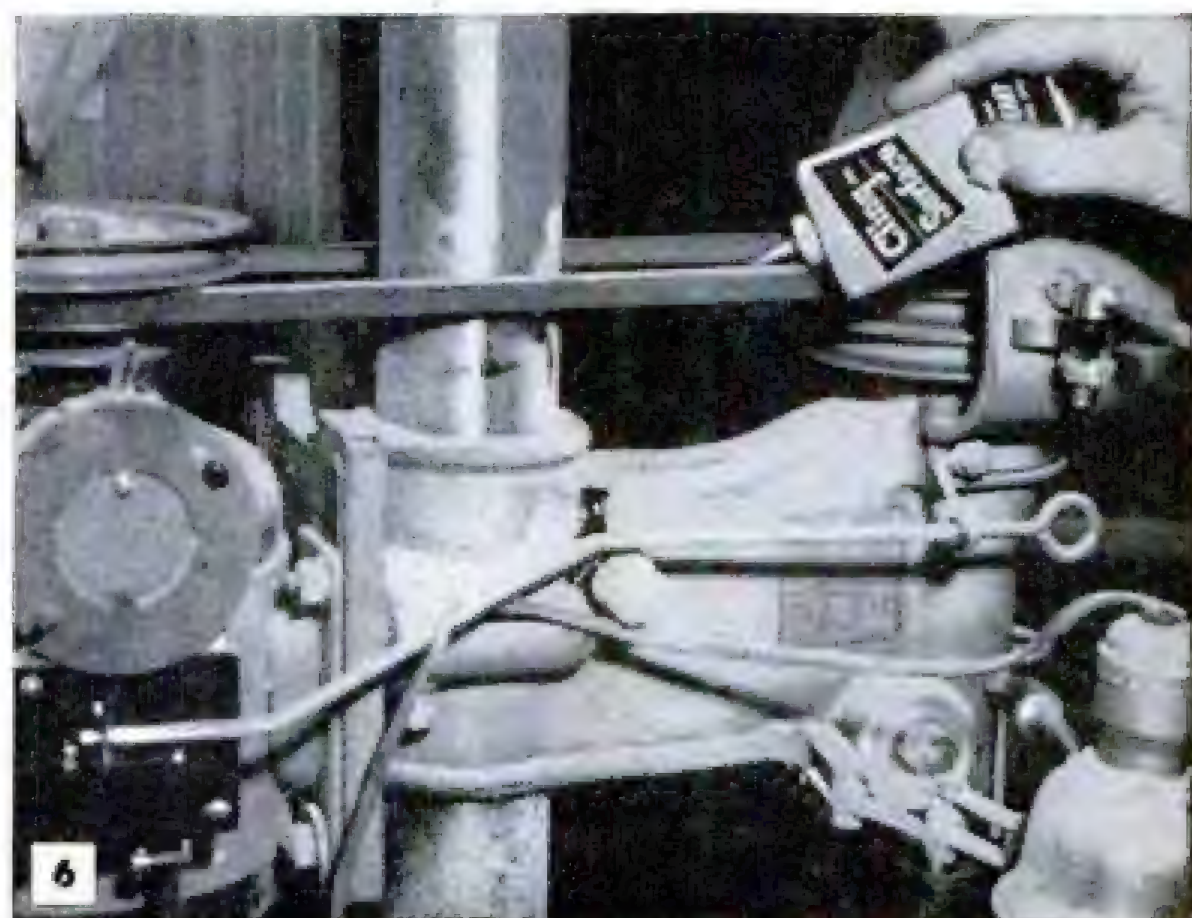
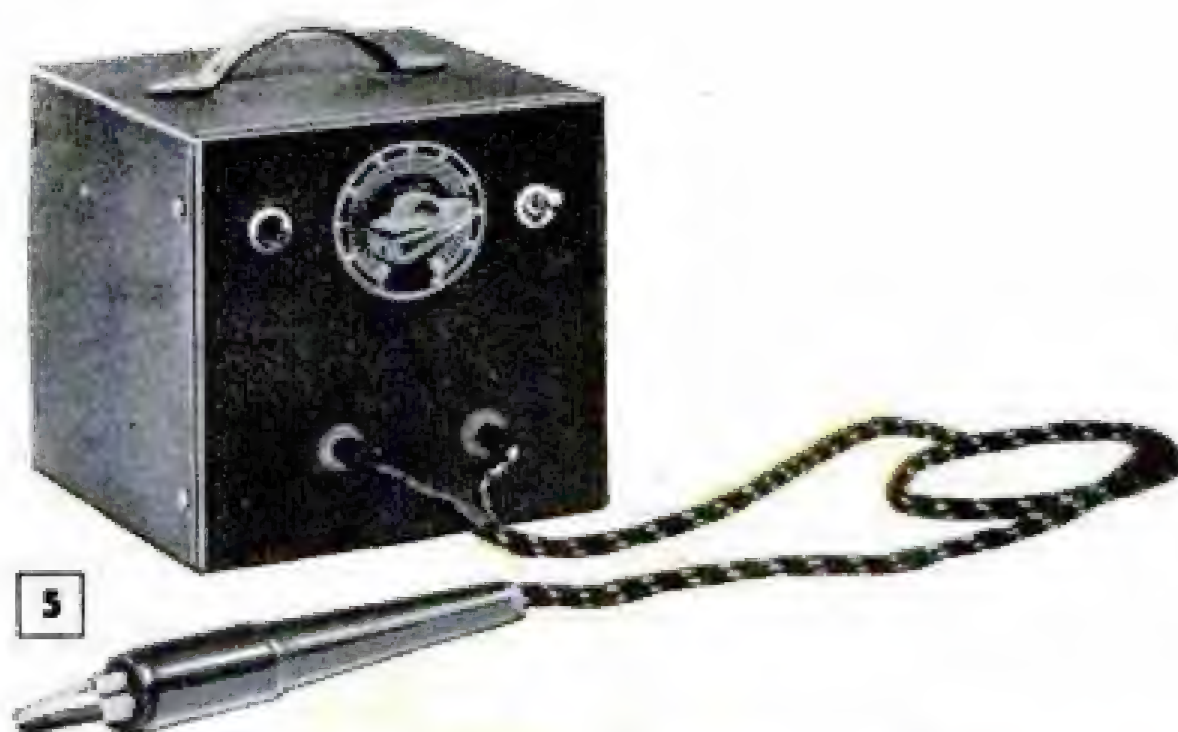
**5. RESISTANCE-TYPE SOLDERING UNIT** is made for fine work on jewelry, radios and instruments. Operates on 110-volt a.c. with current consumption of only 6 amp. at full load. Electrical unit is housed in a small metal cabinet and single knob controls current from stand-by to full capacity. Carbon tips come in 3 sizes,  $\frac{1}{8}$ ,  $\frac{1}{4}$  and  $\frac{5}{16}$ -in. dia. Holder is 6 in. long

**6. V-BELT DRESSING** dissolves the glaze which forms on belts in normal use and prevents slippage under heavy loads. Material clings to belt, does not pile up on pulleys even at high speeds. Comes in handy can with applicator-type spout that makes it easy to apply a few drops to the wear surfaces where it distributes evenly

**7. PENCIL-SIZE SOLDERING IRON** has a  $\frac{1}{8}$ -in. tip which permits placement of a drop of solder almost anywhere you can insert a pencil point. Designed and engineered for small electrical-parts assembly and laboratory work. Metal parts are of stainless steel for exceptionally long life. Heating elements are furnished in 25 and 40-watt sizes, both with a  $\frac{1}{8}$ -in. tip

**8. RUBBER MOLDS** form undercut recesses in concrete for anchoring the plaster coats. The molds, or disks, are about 2 in. in dia. and  $\frac{3}{8}$  in. thick and are nailed to the wooden forms in a regular pattern. When the concrete has set and the forms are removed, the molds pull out of the recesses without breaking the undercut edges. Molds can be reused

**9. 12-POINT SPLINE** on screwhead prevents wrench slippage and eliminates hand starting in nearly all applications where power drivers can be used. Available in machine-screw types and in ferrous and nonferrous metals. Tapered head adds decorative touch to products on which screws can be used. Resistance of head to breakage permits higher torque



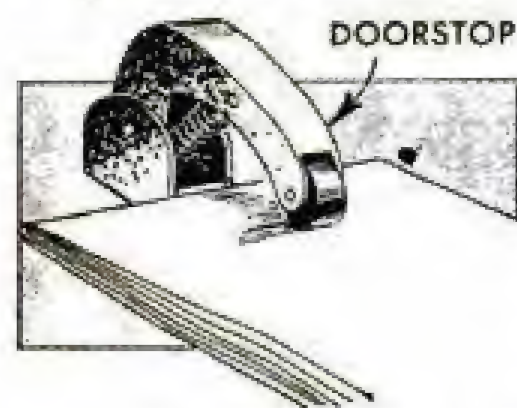


## Feed Lot Back Scratcher From Old Tractor Tire



A section cut from an old tractor tire and bolted securely to heavy posts set in the corner of the feed lot makes a good back scratcher for cattle confined to the lot for long intervals. The posts that support the tire section should be set in deep holes, and either soil or, better still, crushed stone firmly tamped around them. The distance between the posts should approximate the center-to-center diameter of the tire, so that when bolted in position it will take its natural curve without kinking.

## Improved Paper Hold-Down



To prevent instruction blanks and order sheets from blowing off his desk, one service manager uses a screen-door catch of the type shown. Although

held firmly by the strong spring tension, papers can be removed with little difficulty due to the rubber roller.

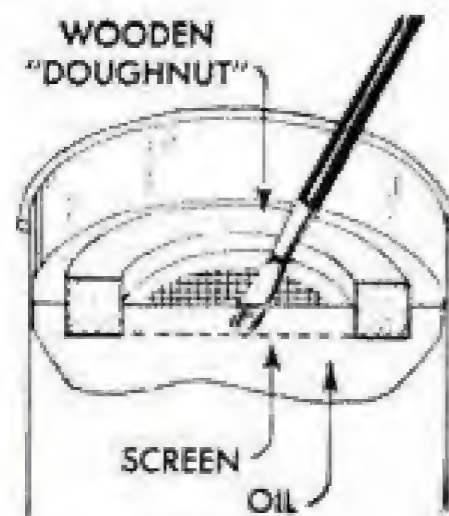
## Testing Sand for Impurities

Before sand is used for making concrete, it should first be tested for impurities. This may be done in the following manner: Dissolve lye, 1 heaping teaspoonful, in clean water,  $\frac{1}{2}$  pt., contained in a glass jar. After pouring sand,  $\frac{1}{2}$  pt., into the jar, replace the

cap and shake the jar vigorously. If, after 24 hr., the water appears no darker than apple-cider vinegar, the sand will be suitable for use.

## Wooden Ring Supports Brush In Cutting-Oil Can

One large machine shop saved more than half of its cutting-oil bill, and kept its tools and work much cleaner, by using this wooden ring to support the brush in the cutting-oil can. The



ring is of soft wood,  $\frac{1}{2}$  in. thick, with a disk of screen wire tacked to the bottom of it. After assembly, the entire unit is given a coat of shellac. In use, the ring floats in the cutting oil, supporting the brush so that just the right amount of oil is on the brush. A stiff-wire brush rest may be bent and hooked or soldered to the can to hold the handle of the brush at the proper angle.

A. L. Jewett, Woodbridge, Conn.

## Lathe Center Drives Small Work

When light work is to be machined its full length while held between centers on the lathe, it can be driven by the lathe center shown in the detail. The center is drilled longitudinally and counterbored to



receive a small-diameter flisterhead cap screw. The end of the work is drilled and tapped to receive the screw. The work is then screwed onto the end of the screw, after which the center is mounted in the headstock spindle of the lathe.

## Painting Hot Surfaces

One of the most economical ways of painting surfaces that reach temperatures above 350 deg. F., such as smokestacks and boilers, is to give them a coat of black asphaltum varnish. Although this may not last very long if the temperature is extremely high, the cost of renewing the finish is comparatively low inasmuch as the varnish is inexpensive. Oil paints are not satisfactory because temperatures above 350 deg. are harmful to the linseed-oil binder.



## ELECTRONICS TODAY

A SYRACUSE, N. Y., housewife, Connie Hodgson, photo A, dropped a one and lost a trillion in a test of skill against General Electric's electronic computer, OARAC.

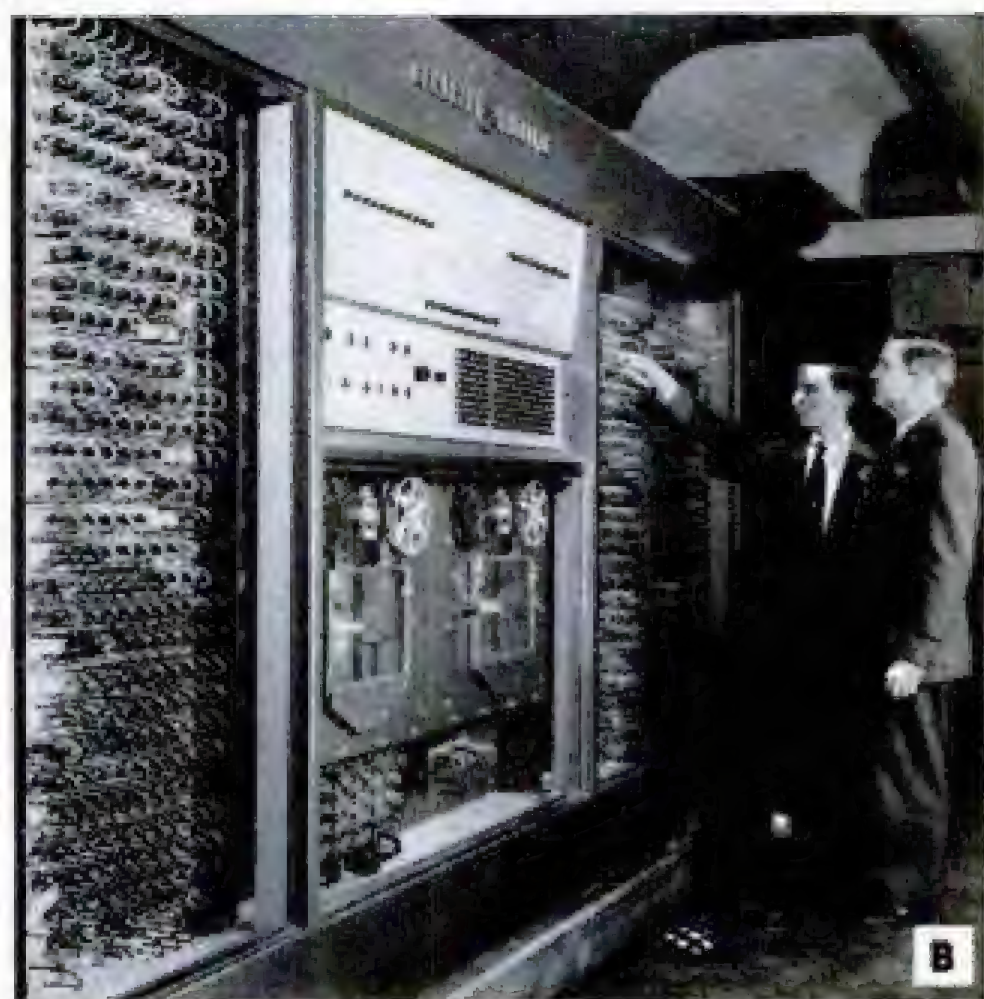
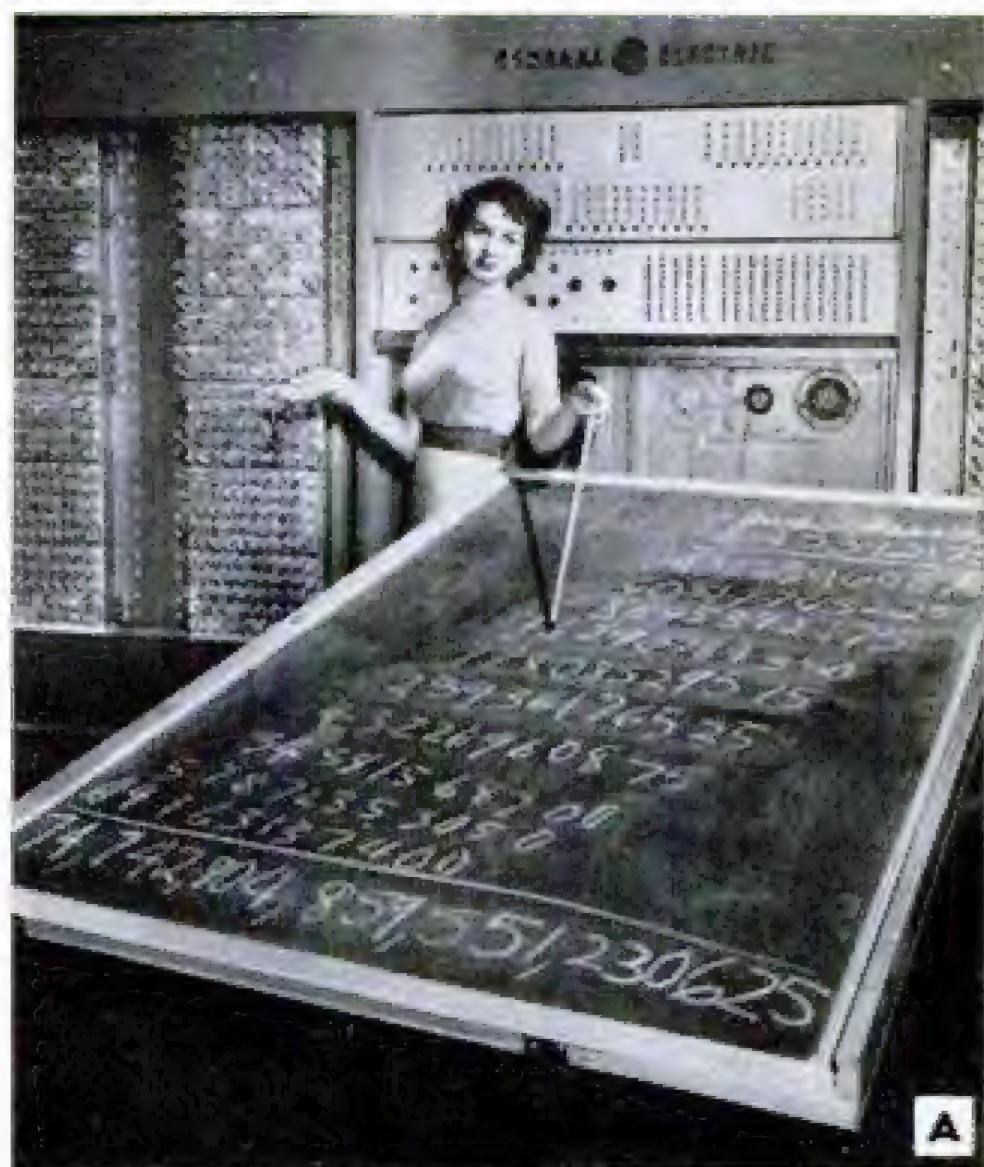
She was one of six intelligent adults who pitted their multiplication skills against this digital computer soon to be delivered by this manufacturer to the U. S. Air Force's Research and Development Command.

OARAC can multiply 8,645,392,175 by 8,645,392,175 in approximately  $\frac{1}{1000}$  second. In a test, the average time for the six human contestants was more than eight minutes, the fastest,  $4\frac{1}{2}$  minutes. None of their answers coincided. Like Mrs. Hodgson, who forgot to carry a one in the row to which she is pointing and came out one trillion off, none of them got the correct answer—which is 74,742,805,859,551,230,625.

The center section of the OARAC, photo B, contains the operations panel and tape mechanisms; this panel is flanked on either side by rows of plug-in turrets containing the 1400 tubes used in the computer.

Transistors energized by a pill-sized "energy capsule" replace A and B-batteries in the new tubeless Maico Transist-Ear hearing aid. Cleverly concealed in one of her Hear-Rings, photo C, is a tiny receiver, which in turn is connected to a small hearing-aid amplifier unit hidden in her hair; transistors replace the conventional tubes. Photo D shows this complete miniature hearing aid in operation under a swimming cap.

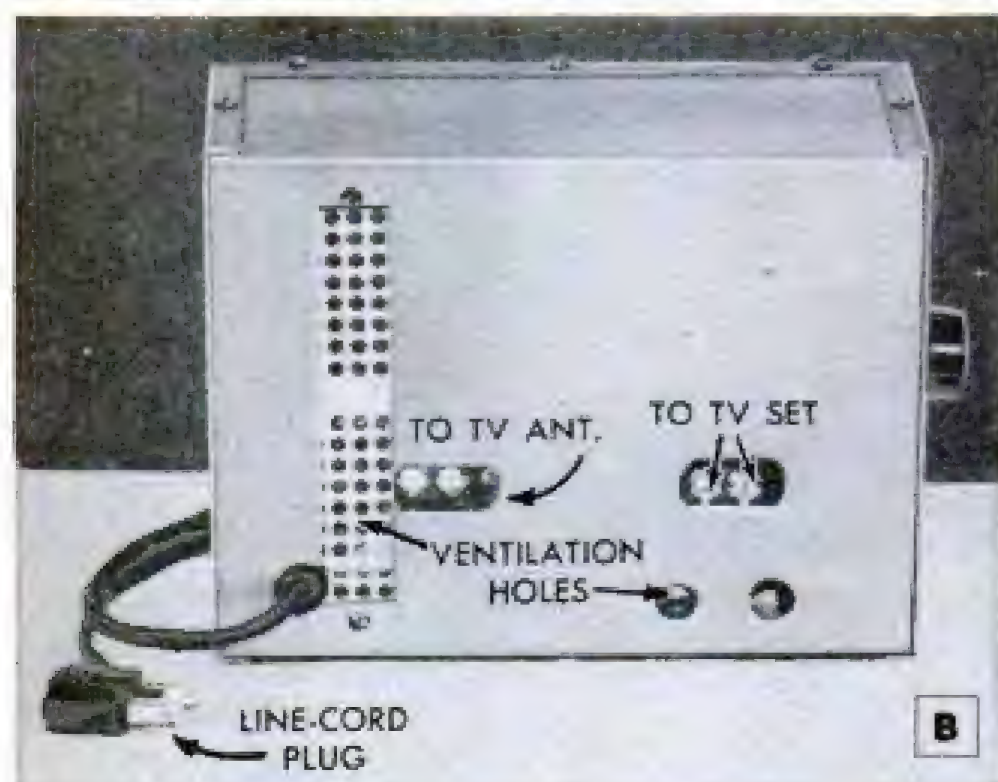
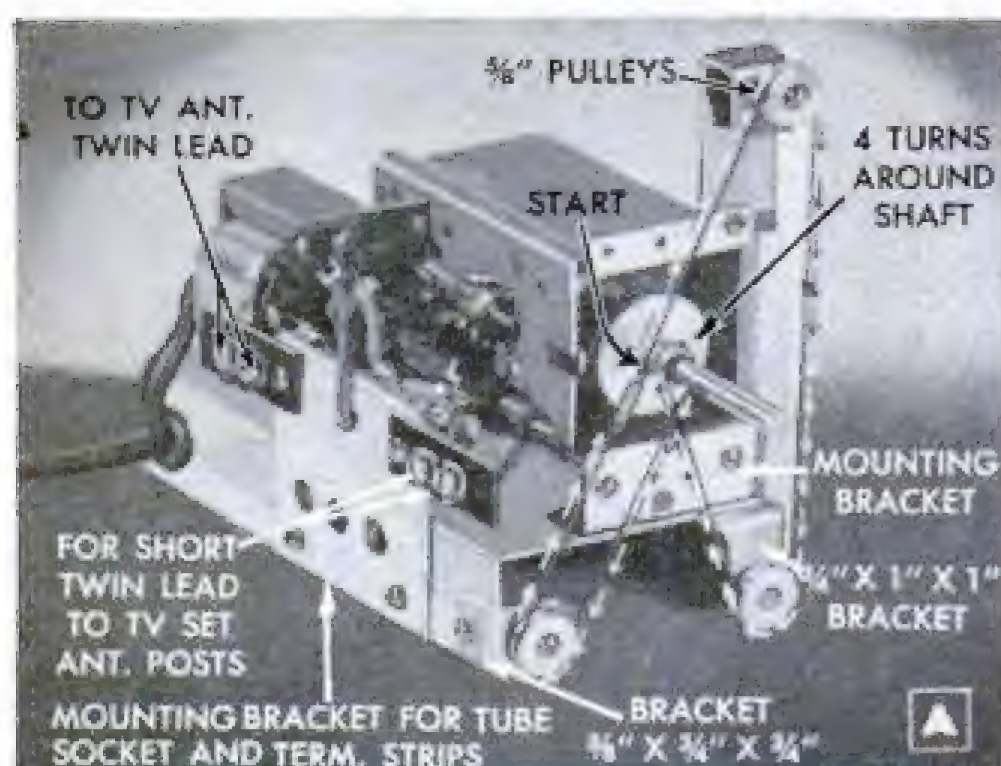
The progressive reduction in size of hearing aids is illustrated in photo E. From the quaint old ear trumpet to this tiny 1953 transistor hearing aid, that the young lady is pointing to, it appears that real progress started about 1945.





# TV SIGNAL BOOSTER FEATURES

By S. A. Johnson WØLBV



HERE is a television booster that will extend the fringe area as much as 20 miles in many cases, and is effective on all 12 VHF channels. It uses the well-known golden-grid tube—the low noise 6BQ7 twin triode. The tube is a 9-pin miniature type with gold-plated grids.

The booster illustrated and described for construction utilizes one of the popular "cascode" circuits, which have justly earned their reputation for excellent gain with a minimum of noise. Although definitely not designed for beginners, the circuit is quite simple; owing to its necessarily compact design to insure extremely short leads, it presents more of a mechanical job than a wiring assignment. Many of the component parts are very tiny as compared with ordinary broadcast-receiver construction.

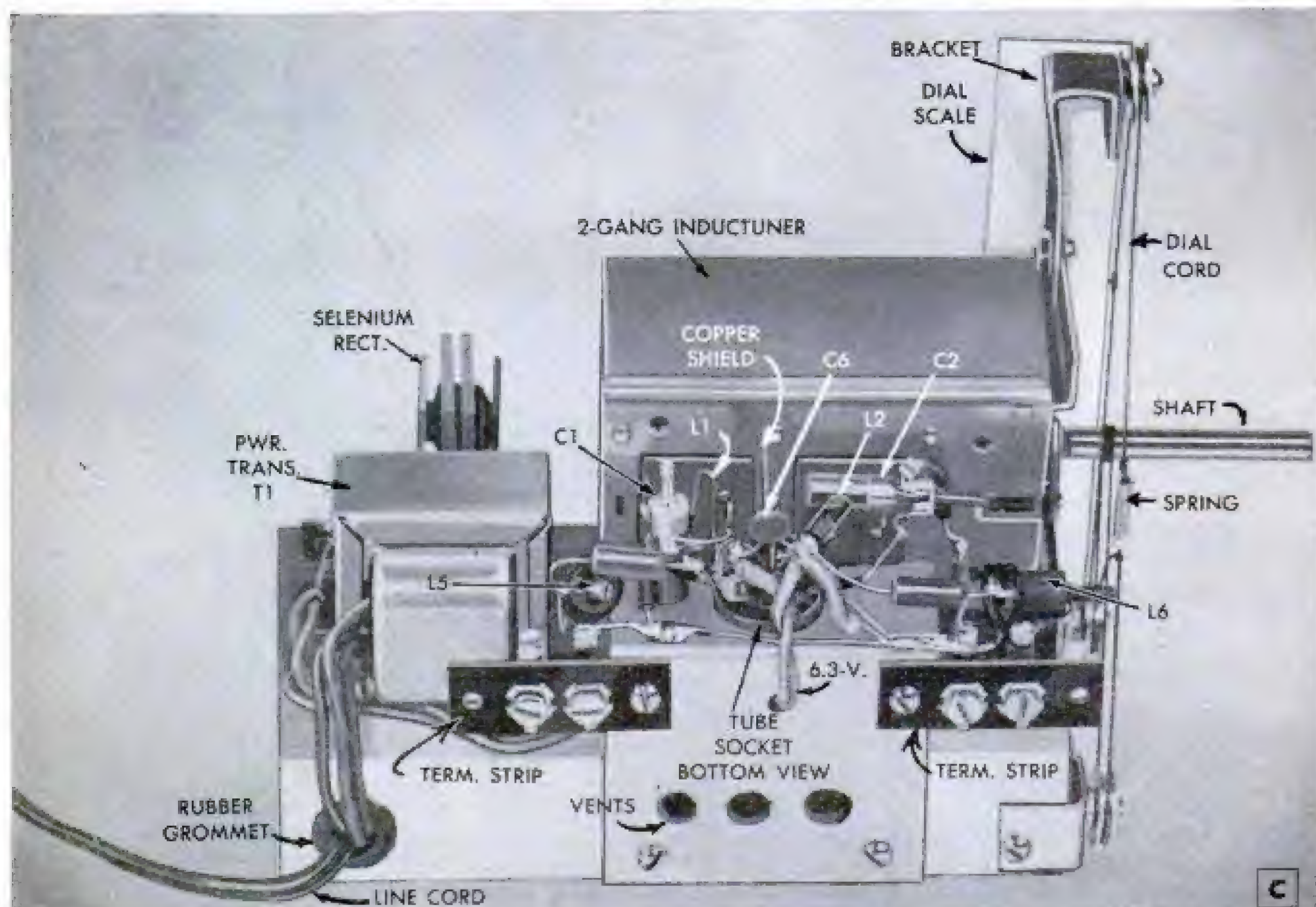
The booster is continuous tuning—covering all the VHF-TV channels from 2 to 13

## CAPACITORS

C1 AND C2=.5 TO 3-MMFD. TUBULAR-TYPE TRIMMER (MALLORY No. CT565 OR No. CT565A)

C3 AND C4=3.3-MMFD. ZERO TEMP. CERAMIC (MALLORY No. ZT5533)

C5, C6, C7 AND C8 ARE ALL .001-MMFD. DISK CERAMIC TYPE  
C9 AND C10, A DUAL 20-MMFD. 250-V. TUBULAR-TYPE ELECTROLYTIC



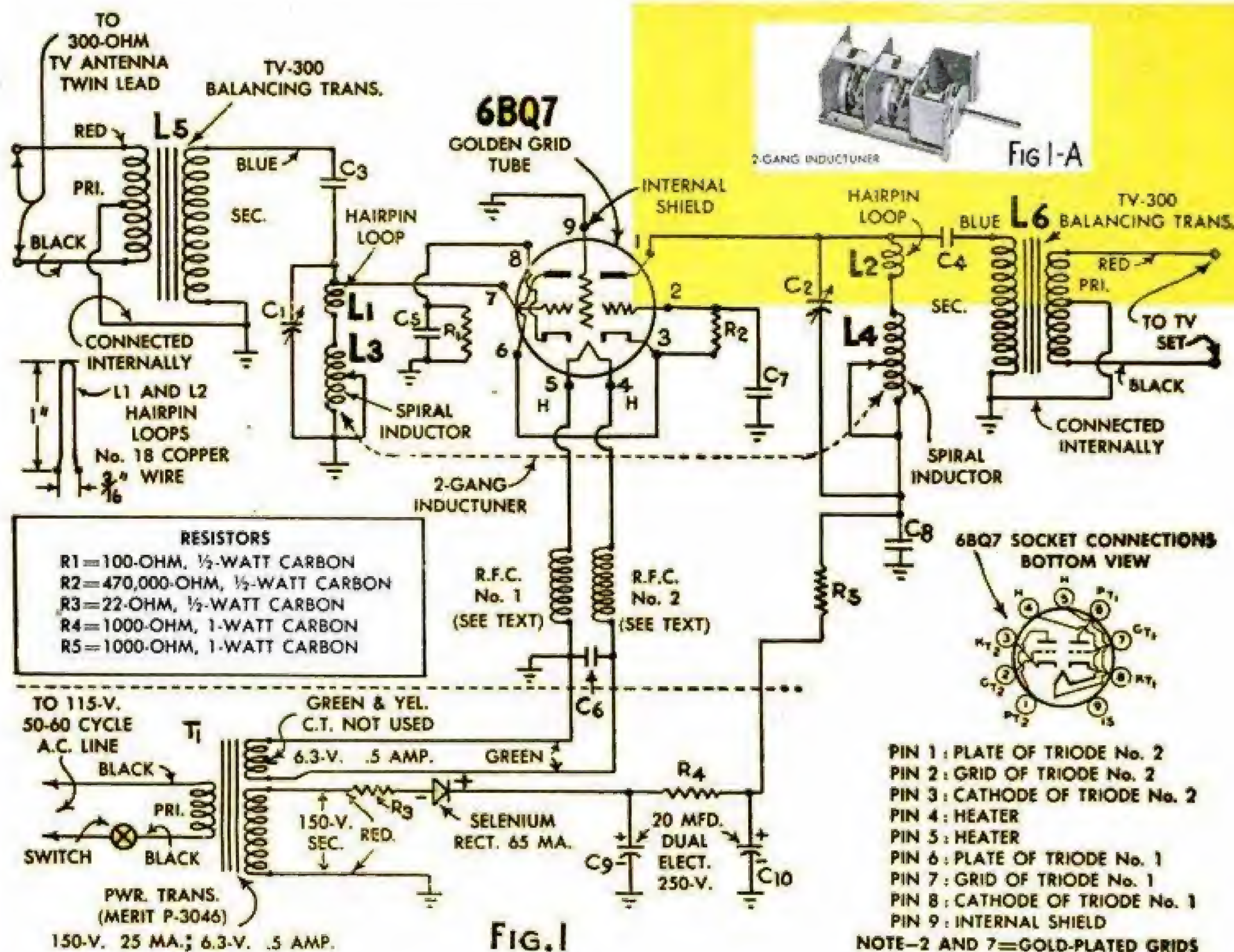
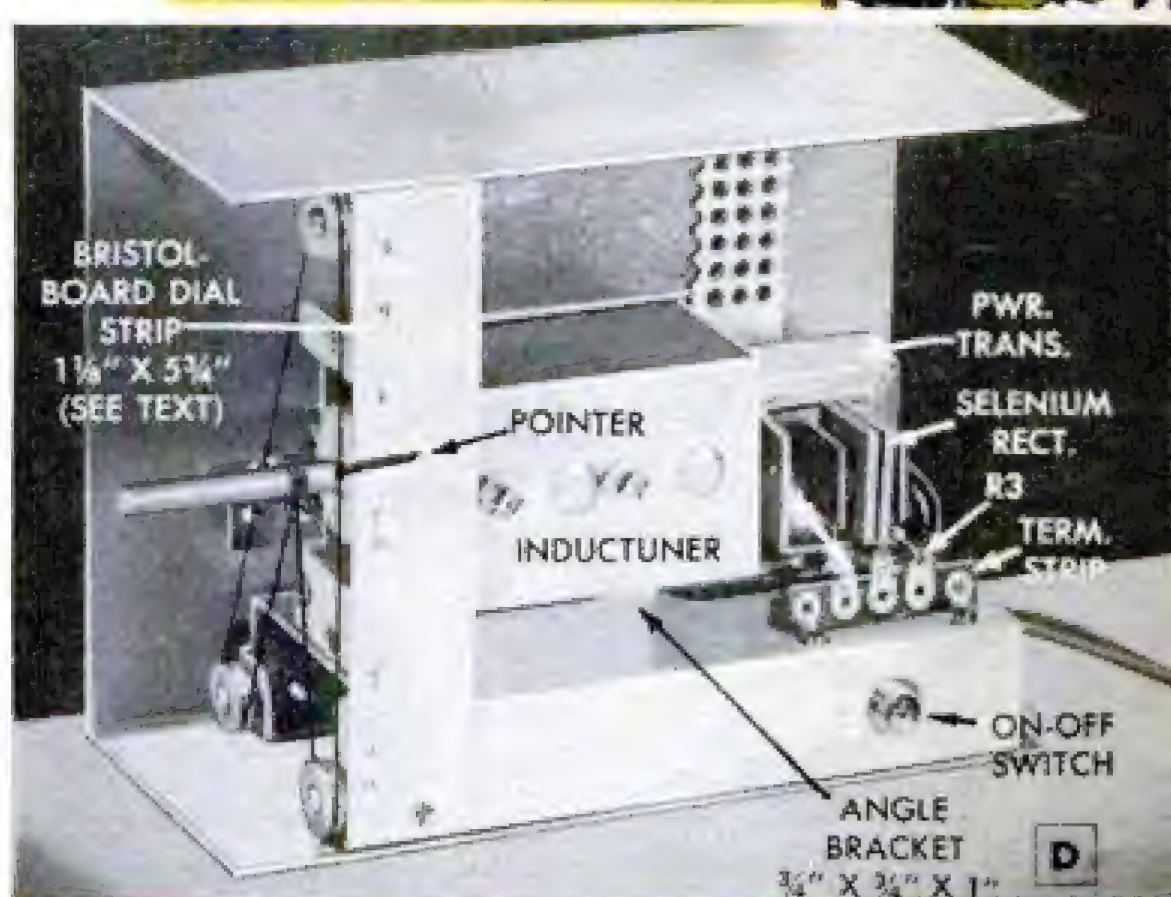
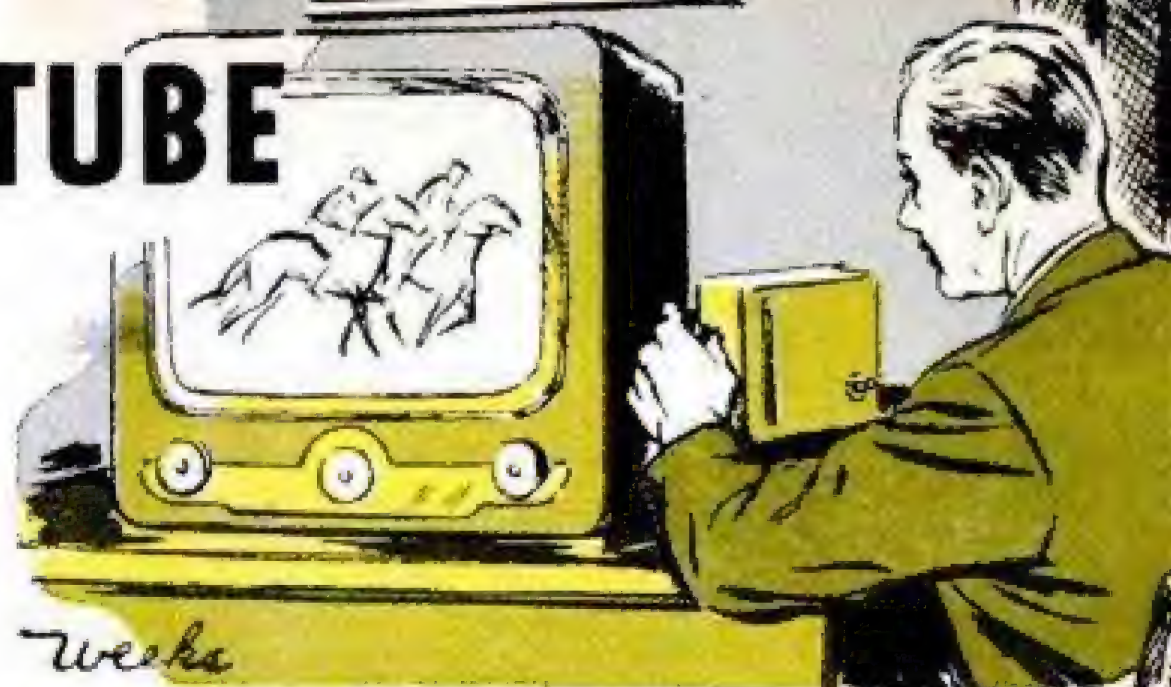


# "GOLDEN GRID" TUBE

inclusive and, in addition, it tunes the FM bands in between. In order to solve the very difficult problem of providing a suitable tuning device, the 2-gang Mallory spiral inductuner was chosen. This unit is smooth in operation, and makes possible a compact and efficient layout. It is connected in series with the 300-ohm antenna twin lead and the antenna posts on the TV receiver.

Power for the unit is provided by a very simple a.c.-d.c. power pack, unlike most a.c.-d.c. circuits, it is entirely aboveground, thus there is no "hot chassis" or cabinet. Furthermore, it provides some circuit isolation which is desirable in high-frequency equipment. This power pack delivers about 150 volts, sufficient to operate the tube with good efficiency, but low enough to discourage spurious oscillation. Thanks to the compact layout, the booster fits into a standard, readily available Flexi-Mount aluminum case that is listed in all radio-parts house catalogues.

The actual working parts of the booster are mounted on the small aluminum chassis and brackets detailed in the lower sketch in





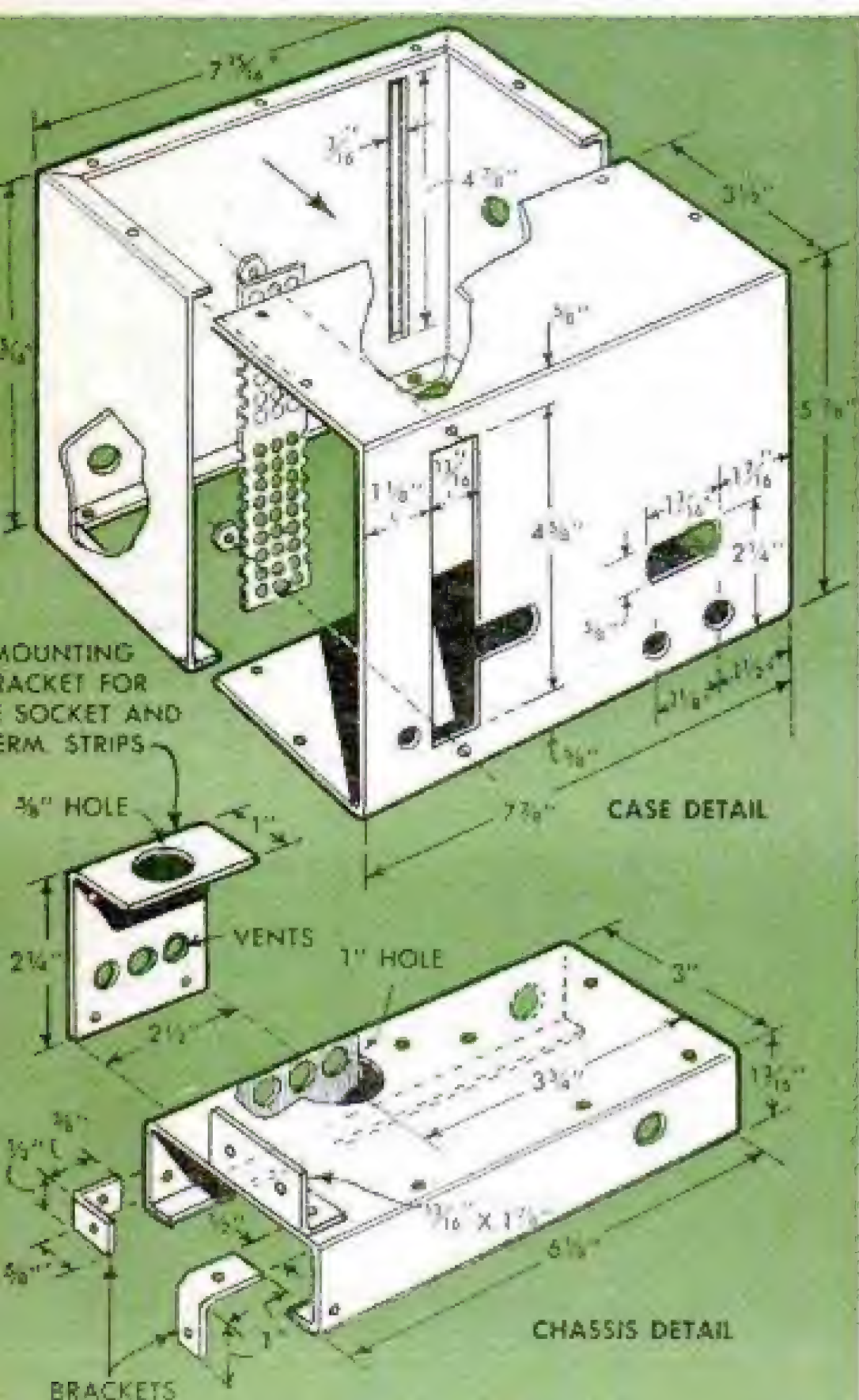
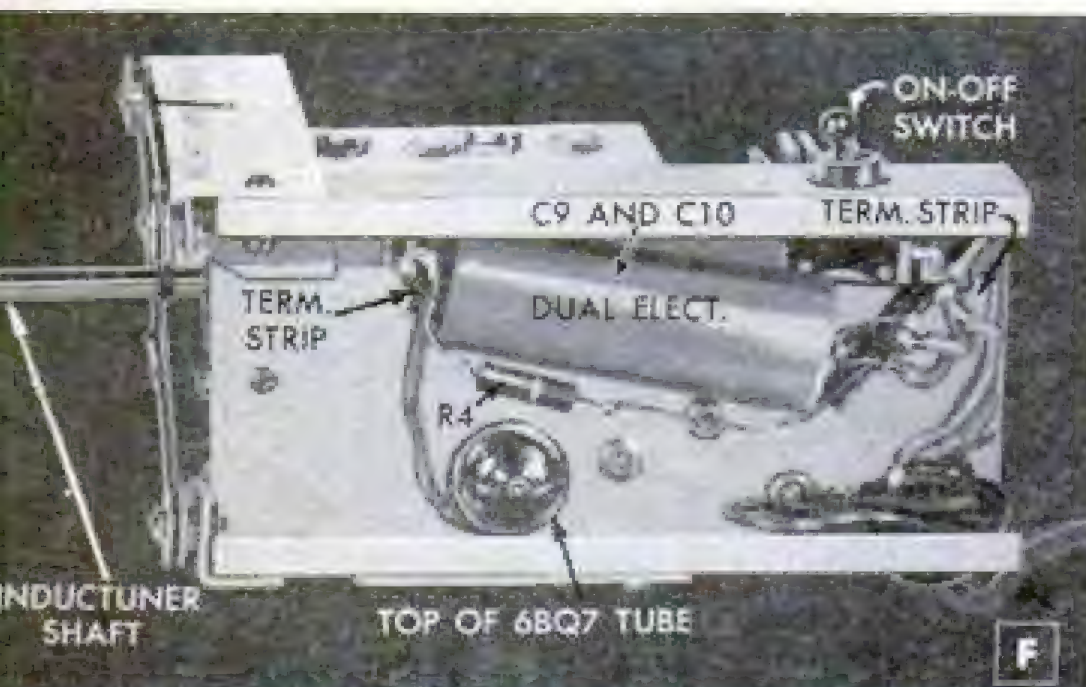
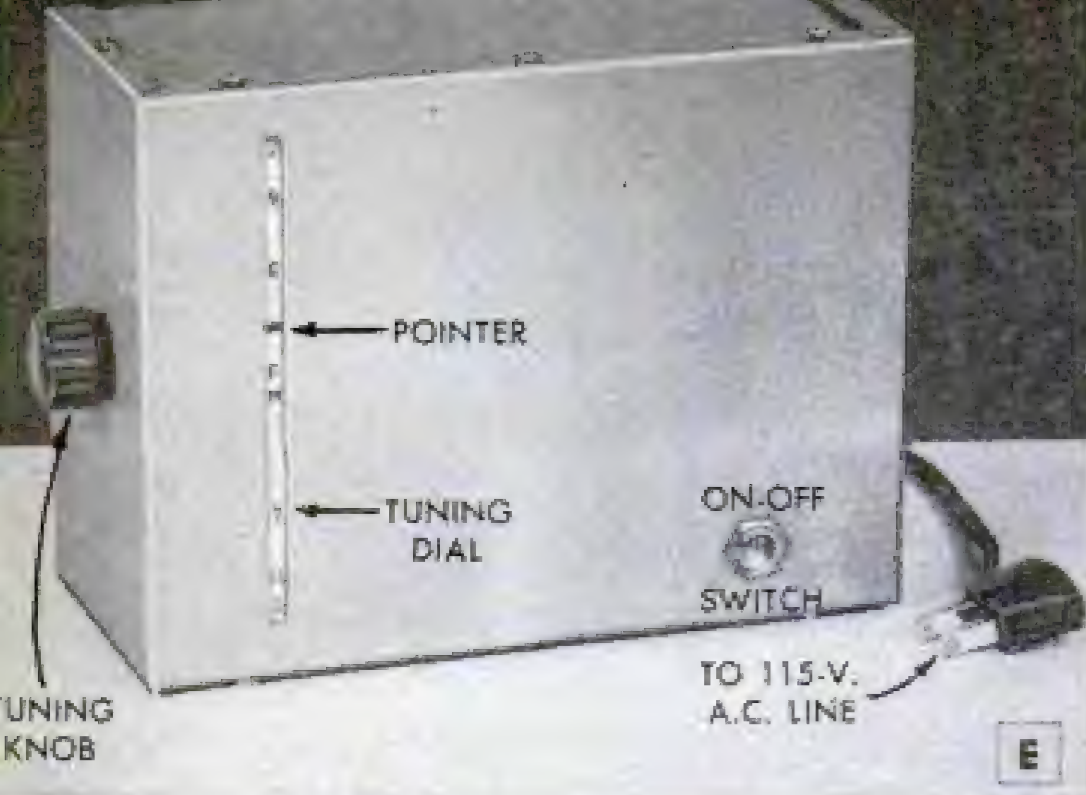


Fig. 2. The standard-size chassis base and homemade mounting brackets are sheet aluminum. Note that the tube is mounted upside down, in order to keep the highly critical r.f. leads as short as possible. Its location on the large mounting bracket is clearly shown in photo C. Case details are given in the sketch above the chassis base in Fig. 2. Front and back views of the completed booster are shown in photos B and E. Good ventilation must be provided as indicated in photos B and C. If the perforated metal-strip material is not at hand, merely drill a series of small holes in the rear cabinet section in the same location.

In the actual wiring, leads in the usual sense should just about be eliminated; the various parts in the r.f. section of the schematic circuit diagram Fig. 1 being mounted as close as possible to the tube element pins on the tube socket. All grounds in the portion of the circuit above the dotted line should be made to a single point, the center post of the tube socket. The parts must be close together, so use a small iron to avoid shorts in soldering; soldering being done with rosin-core wire solder.

The tiny thin-copper shield, see photos A and C, is the last part to be put in place. It should be connected by soldering it between the center ground post on the tube socket and the ground terminal on the inductuner. The shield is  $\frac{3}{4}$  in. wide and  $1\frac{1}{8}$  in. high, cut away slightly at the lower front edge. R.f.c. 1 and r.f.c. 2 consist of 4 turns each close wound on a  $\frac{3}{16}$ -in. polystyrene rod,  $\frac{3}{4}$  in. long, connected close to socket.

The dial arrangement is entirely homemade. It consists of a few cents' worth of dial pulleys, cord and a small dial spring—plus a few metal brackets. Bracket and stringing details are shown in photo A. The dial pointer can be salvaged from an old radio or made as shown with a small scrap of copper painted black and crimped to the dial cord, see photo D. The important point is to see that it is light enough so it will be carried on the dial cord. The top pulley bracket, shown in photos A and C, is  $\frac{3}{4}$  in. wide and  $1\frac{7}{8}$  in. high.

The inductuner provides most of the tuning inductance. However, some additional inductance is provided by the small metal "hairpins" (see L1 and L2 in Fig. 1 for detail of these copper hairpin loops), which serve as an adjustable ganging device for the high-frequency band. An underside view of the completely wired chassis base appears in the photo F.

The dial strip, photo D, is made from Bristol board and is calibrated for channel locations in ink as the various local channels are tuned in. In testing the booster, first

(Continued to page 244)



# Radio at Work and Play

ADVANCED METHODS of radio communication now are providing law-enforcement, civilian-defense and other public-safety organizations with several new and highly efficient "working tools." For example: The tiny Handi Micro-Talkie transmitter, shown in photo A, is designed to operate in the 152-174 mc. frequency band. This complete transmitter uses eight subminiature-tube stages with printed associated circuits. The rigid loop antenna also doubles as a carrying handle.

Another radio aid for workers in civilian defense, public safety and transportation communications systems is the new Motorola single-tone selectivity-signaling system illustrated in photo B. The system enables any operator to initiate an operation at one or more remote points through an intervening communication system. Operator selects particular car receiver, or group, by remotely controlled panel lights or alarms.

The next table-model broadcast receiver in your home will probably employ a completely plated circuit, especially if it is a very small, compact type. The one at left in photo C uses the same number of tubes and components as the standard set at the right.

This country has no monopoly on tiny receivers for entertainment purposes. The young lady on the motorcycle in photo D enjoys local programs while she rides through the countryside near Milan, Italy.

The code records and instruction book shown in photo E, enable beginner hams and Boy-Scout groups to qualify for licenses.





# SELF-HELPS FOR TV-SET OWNERS

PERHAPS the screen on your television console is positioned too low for easy viewing. Furthermore, the console may not be placed where you would like it in the room, but owing to its weight and lack of casters it is not easy to move around.

It is not difficult to construct an attractive low box, or platform, from several pieces of  $\frac{3}{4}$ -in. plywood, four heavy-duty casters and a little stain and varnish. Exact dimensions will, of course, depend upon the height, width and depth of your console. In most cases it should be about 8 in. high, as wide as the console and perhaps a few inches deeper. The platform shown in photos A and A-1 is open at the back and partitioned for greater supporting strength. The front panel can be made removable as shown in photo A-1, the platform thus providing handy storage space.

Many TV receivers are arranged to play records through the sound section. This is done by connecting a turntable by means of a shielded lead and plug to a phono jack on the set. A switch of the type shown in photo B is thrown to "PH" for this purpose. If your TV picture tube does not brighten, check this switch as it may have been left in the phono position after playing records.

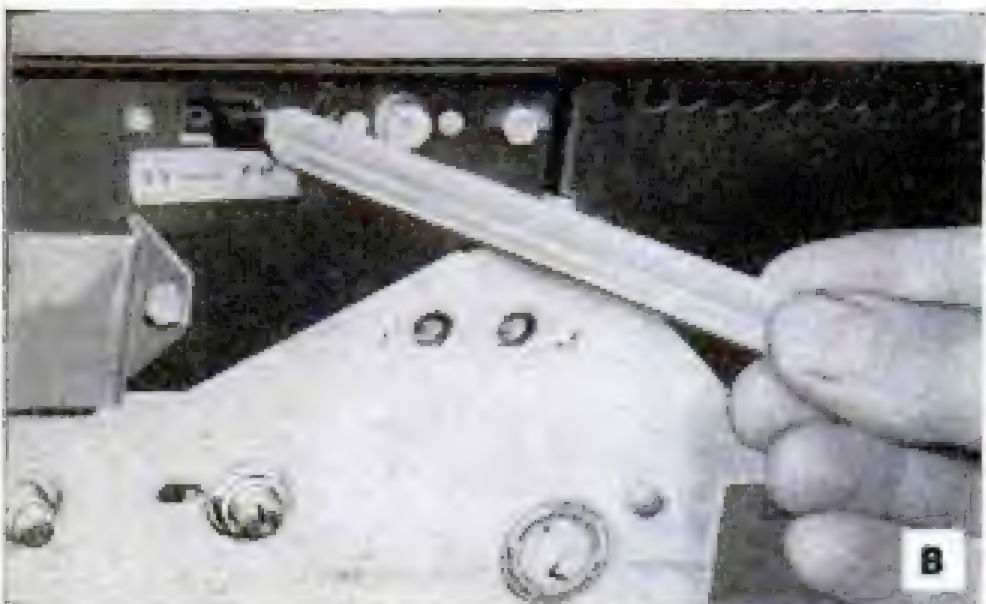
Always keep the back of a TV receiver away from the wall to permit proper air circulation. Photo C shows the use of doorstops on the baseboard to insure proper spacing. Interference streaks across the picture tube are often caused by entangled cords to lamps, clocks and other devices near TV-antenna lead-in cable, as illustrated in photo D. Desk gliders are a good substitute for casters in an emergency moving operation, as shown in photo E.



A



A-1



B



C



WRONG

D



E



"Bill, you're really proud of that

Superior Mechanics  
Guild sticker."



"I sure am, kid. As proud as you are of your reputation as a hotshot trouble-shooter. I'm proud of the tools in that kit too.

I felt lucky when they picked me for that award. You'll be the next in the shop to get it—so save your wise talk. You're smart at using your head. Be smart with your hands, too, and never use anything but those Bonney knuckle-savers.

Here's some more good advice: 'If you're short, buy BON-E-CON\* tools.' Either way, they're topnotch tools at the right price."



\* The new Bonney  
economy-priced line

Remember. Your local Bonney Jobber, as well as Bonney, stands behind the tools you buy. He has Bonney tools priced to fit your needs as well as your pocketbook.



# See how Kodachrome Film opens up all the ways to enjoy the magic of color

**Kodachrome** is one of the most rewarding of all films. Here are all the ways you can enjoy it. And on opposite page are moderately priced Kodak cameras for Kodachrome pictures—and other special color equipment. Color is easy and inexpensive the Kodak way.



↑  
A Kodachrome transparency costs as little as 16¢ complete

You can project it →  
for brilliant,  
large-group shows



You can enjoy convenient  
↓ viewing for  
small groups



↑ You can give  
Kodachrome Prints to  
friends and relatives



And Kodachrome ↑  
Enlargements up to 8 x 10  
inches make handsome  
gifts for special occasions





**Brilliant, inexpensive slide projector**—The Kodaslide Merit Projector features the new-type slide feeding in *top* to prevent jarring projector when changing slides. Large-size lamphouse of new design assures efficient cooling. Built-in elevating mechanism. Powerful 150-watt lamp. \$26.10. Carrying Case, \$7.50.

**Thrifty color camera**—The famous Kodak Pony 135 is a lightweight, heavy-duty 35mm miniature. Makes superb color slides on 20- or 36-exposure Kodachrome Film. Kodak Anaston *f*/4.5 Lumenized Lens; built-in flash synch. Speeds to 1/200. \$35.75. Flashholder, \$8.25.

**Wonderful "miniature"**—The Ektar *f*/3.5 Lens on the Kodak Signet 35 Camera gives you *extra* color purity in each Kodachrome shot. The only miniature with ball-bearing action for ultra-smooth focusing. Spring-loaded bearings in range-finder mechanism eliminate play, insure supreme accuracy. Unusually compact. Built-in flash synch. Speeds to 1/300. Automatic film count, stop, and double-exposure prevention. Only \$92.50.



**New 300-watt slide projector complete with quiet fan cooling**—The Kodaslide Highlux III Projector has two condensers, 300-watt lamp, Kodak Projection Ektanon Lens *f*/3.5. All combine to produce extra brilliance, extra color purity throughout slide area. Fan cooling. New-type slide feeding in *top*. \$56.50, including carrying case.



**Versatile "flash" system** (*left*) permits use of extension units, remote release. Battery-condenser power. Kodak Ektalux Flashholder only, \$29.75.

**Kodaslide Table Viewer 4X** (*right*) enlarges slides more than four times. \$49.50. Case, \$15.50.



**For Kodachrome shots**—Kodak Tourist Adapter Kit (*left*) adapts deluxe Tourist Cameras for Kodachrome pictures. \$13.25.

**Kodaslide File Box** holds 150 cardboard or 53 glass slides. \$1.57. Kodaslide Compartment File holds even more. \$3.94.



Your Kodak dealer will be glad to help you choose the right equipment for taking color pictures. Be sure to see him soon.

*Prices subject to change without notice and include Federal Tax where applicable*

**Eastman Kodak Company, Rochester 4, N. Y.**

**Kodak**



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# THE **VIGORO**\* FAMILY OF GARDENING AIDS

Vigoro is the trade-mark for Swift & Company's complete, balanced plant food.

**End-o-Weed**  
2,4-D Selective Lawn Weed Killer destroys dandelions, over 100 different kinds of lawn weeds without harm to ordinary lawn grass.

**End-o-Weed CRAB GRASS KILLER**  
checks and kills crab grass and chickweed without permanently harming lawn grass.

**End-o-Pest**  
... gives quick, 3-way protection against chewing insects, sucking insects, fungus diseases.

**End-o-Pest ARC**  
kills lawn Ants, Roaches, Chiggers, and many other lawn pests. Effective for as long as 90 days.

**NEW instant VIGORO**  
Vigoro... in handy, water-soluble form! You mix it with water and apply as a liquid. Contains all the food elements plants need from soil.

**VIGORO\***  
complete, balanced plant food—so effective that by actual test it can make plants grow and thrive even in plain sand!

*all you need to make all you grow.. grow its best!*




Here's a job you can do yourself

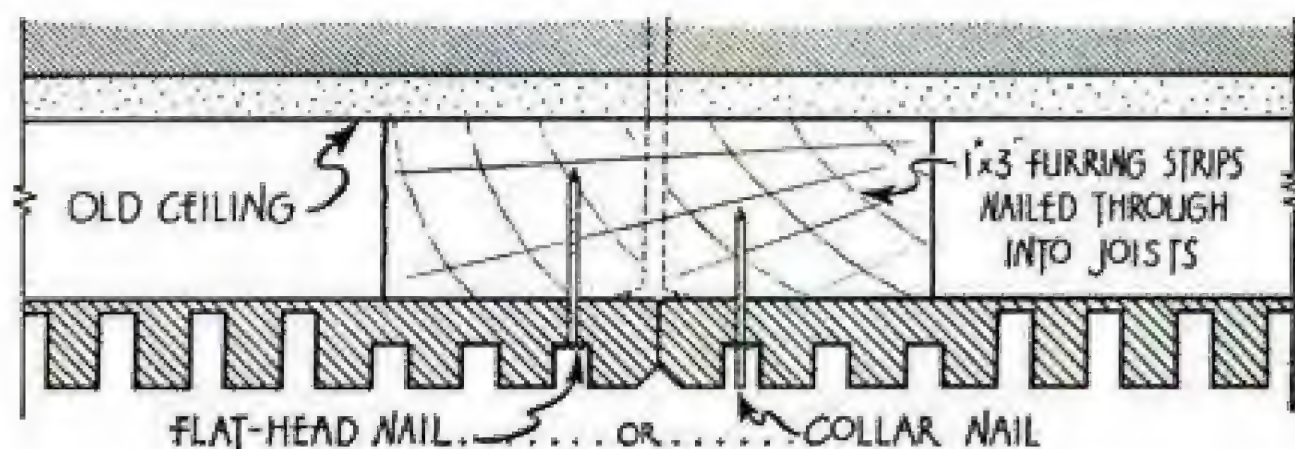
## ADD "QUIET" TO YOUR HOME with Armstrong's Cushiontone



Your whole house will be quieter when you've installed ceilings of Armstrong's Cushiontone in your noisiest rooms. This low-cost tile is the same material used to stop noise in radio stations, restaurants, and theatres.

Cushiontone is a wood fiber material drilled with hundreds of tiny perforations. These holes actually soak up sound so it can't bounce around the room and become disturbing. Cushiontone's smoothly painted surface makes a handsome ceiling, too. It can be repainted without loss of acoustical efficiency. You'll find the 12"x12" tiles easy to install—either by nailing to wood strips or cementing right to the old ceiling.

Your lumber dealer will give you full details on Armstrong's Cushiontone. For your free booklet describing this sound-absorbing material, write to the Armstrong Cork Company, 9006 Stevens Street, Lancaster, Penna. 



Apply Cushiontone over 1" x 3" furring strips nailed to the old ceiling. Nail through the shallow-drilled holes at corners. Flat-head nails, if used, are set. Collar nails are driven flush with surface of tile. Start nails before positioning tile.

# ARMSTRONG'S BUILDING MATERIALS

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# Care and Feeding of Engines

BY S. P. CORP

## SPARK PLUG STORY

When your engine misbehaves, look to your spark plugs for evidence. Here are some clues you may find on the porcelain and the electrodes:

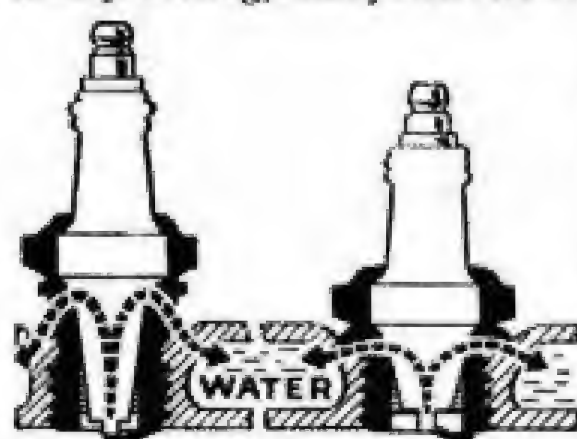
**Brown powdery deposit** is normal with regular fuels.

**White or yellow powdery deposit** is normal when using leaded fuels.

**Black-wet deposit** indicates an excessive amount of oil is getting above the piston or plug is too cold.

**Black-fluffy deposit** indicates carburetor needs adjusting; mixture is too rich or plug is too cold.

**White blistered condition** indicates too-lean mixture, faulty timing, leaky valves, or too-hot plug.



A B  
HOT AND COLD PLUGS

The design of a spark plug determines whether it is hot or cold. "A" is a hot plug because heat is farther from water. "B" is a cold plug, dissipating heat faster because closer to water.

If engine operates under conditions which maintain high engine temperatures, a cold plug should be used. If normal engine temperatures are low, a hot

plug is called for. *Always use a spark plug with the heat range recommended by engine manufacturer.*

## VACATION PREPARATIONS

Before starting your trip, check: **Brakes**, hydraulic system, brake linings, hand-brake cable; **Battery**, test specific gravity; clean, tighten, and coat terminals with petroleum jelly; **Cooling System**, drain, flush, add rust-inhibitor; check hose, pump, and fan belt; **Crankcase**, change oil, replace filter; **Cylinder Head**, tighten bolts to correct torque; **Fuel System**, clean fuel pump bowl, adjust pump and carburetor; **Generator** and voltage regulator; **Lubricate** wheel bearing, universal joints (every 10,000 miles); **Steering**, rotate tires, check alignment; **Starter**, check amperage draw, inspect brushes.



## FREE, FOR YOU!

A postal card will bring your free copy of the new illustrated manual of car care, "MORE POWER, Less Gas, Less Oil." Tells all about Sealed Power KromeX Ring Sets and the famous MD-50 Steel Oil Ring with the Full-Flow Spring. Sealed Power Corporation, Dept. G-6, Muskegon, Michigan.



# Clinic for Homemakers



As a service to our readers in solving the hundreds of problems pertaining to a home—inside or out—the editors of *Popular Mechanics* invite you to present your problems to The Clinic Editor for help and advice. Address your questions to The Clinic Editor, *Popular Mechanics Magazine*, 200 East Ontario Street, Chicago 11, Ill.



## Coloring Concrete

**Q**—I want to color my basement floor a soft gray-green and the question has arisen whether I should use paint or stain. Floor is in good condition, except for one or two small rough spots, and is smoothly troweled. I'm told that the stain requires much more

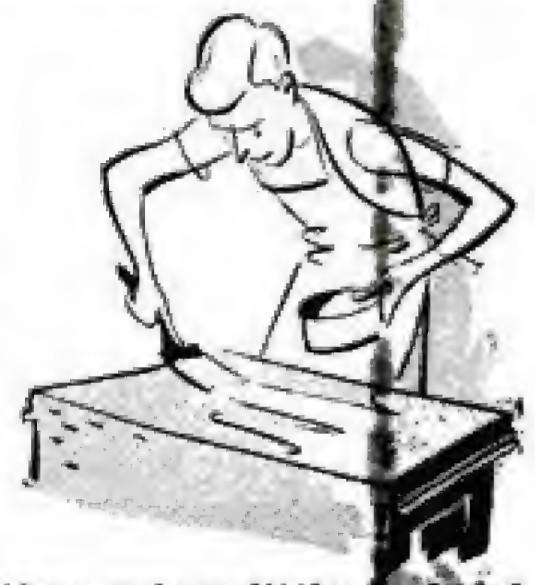
time to apply than the paint. Is this right? What would you recommend?—D. B., S. Dak.

**A**—We'd recommend rubber-base paint especially formulated for use on concrete. Applying either the stain or paint to concrete is not as simple as painting wood, as the floor requires special preparation, particularly when smoothly troweled. The first step is to etch the surface with a muriatic-acid solution. In some cases it is advisable to wash the floor with a trisodium-phosphate solution before etching. A gal. of muriatic acid added to 2 gal. of water will make about the right strength and will etch about 200 sq. ft. of floor area. Mix the solution only in an earthenware container and apply to the floor with a large cloth swab. Do not permit the acid solution to come in contact with the bare skin, as it may cause quite severe burns. After the solution "works," flush the floor with clear water and allow to dry thoroughly. This may require a week to 10 days. A window fan will speed up drying of the floor. When applying rubber-base masonry paint, follow the manufacturer's instructions in all details. Clean the brush in the special thinner that you use to reduce the paint to a brushing consistency. When applying two coats allow at least 24 hr. drying time between coats. The paint should be thoroughly dry before being walked on.

## Pickled-Pine Finish

**Q**—I have an heirloom piece made of pine which I would like to refinish, and have thought of applying what is called a pickled-pine finish, that is, if this is possible. The piece is quite old and the wood is a grayish color but seems to be sound. Is it possible to refinish in a light color?—T. Y., N. Y.

**A**—From your description, we're a little doubtful about the pickled-pine finish proving a success. However, if the wood is sound, as you say, then it may be possible to scrape the surfaces sufficiently



(Continued to page 220)



# \$10,000.00 IN PRIZES

## ENTER RAYTHEON'S TRANSISTOR APPLICATION CONTEST!

Here's the chance-of-a-lifetime to win a big cash prize while gaining valuable "know-how" on the latest electronic development — transistors. Raytheon is offering 17 cash prizes to the seventeen contestants who produce the most ingenious applications of the Raytheon CK722 Junction TRANSISTOR.

Here's all you have to do! Simply build equipment that uses one or more Raytheon CK722 Transistors which you have purchased from your local Raytheon Tube Distributor. Then send a photograph of the unit you have built, a completed official entry blank and a 500 word minimum, 1000 word maximum constructional article on the equipment to Raytheon, P. O. Box 6, Newton 58, Mass. All entries will be carefully judged and prizes will be awarded on the basis of ingenuity of application. Duplicate equipment to be judged on basis of descriptive material. Decision of the judges is final and all entries and their ideas become the exclusive property of Raytheon.

Here's how to enter! Go to your nearest Raytheon Special Purpose Tube Distributor. Get your official entry blank which *must* accompany each entry and which contains complete contest rules or get the official entry blank by writing directly to Raytheon, P. O. Box 6, Newton 58, Mass. Enter today — the contest closes on Midnight August 31, 1953.



*Excellence in Electronics*

**RAYTHEON MANUFACTURING CO.**

Receiving Tube Division

POST OFFICE BOX 6, NEWTON 58, MASSACHUSETTS



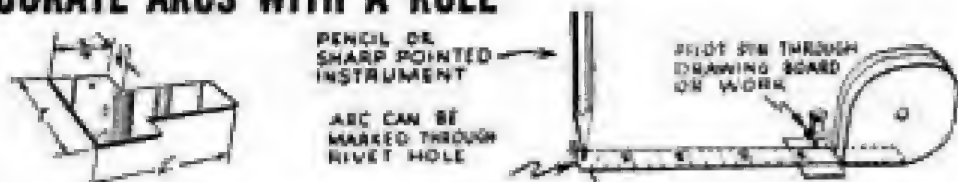
PRIZES	
1st.....	\$5000.00
2nd.....	2000.00
3rd.....	1000.00
4th.....	500.00
5th.....	300.00
6th to 17th	100.00



# How To . . . . BY MASTER

Our #1 contest winner is Andre Senecal of 475 Lansdowne, Montreal, Canada, who gets a Streamline rule for this one:

## ACCURATE ARCS WITH A RULE



Cut a piece of pliable material as indicated. Slide the tongue into case under tape. Insert pin as indicated. Pull out tape to radius desired. Insert sharp pencil into rivet hole and draw your arc.

Contest winner Thomas Ryan of Stone St., New Hamberg, N. Y. requests a "Guardsman wood rule"

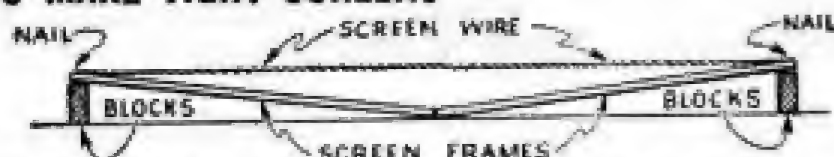
## TO ESTIMATE HEIGHT OF TREE OR POLE

Place a mark on the object to be measured 6 ft. from ground. Now back off until this 6 ft. mark coincides with the 1" mark on your rule. Using 1 ft. to 6" ratio as a guide proceed to measure approximate height.



Richard Baudeck of Buhl, Minnesota, has a dandy entry. He asks for a Tufboy.

## TO MAKE TIGHT SCREENS



Cut screen  $\frac{1}{2}$ " shorter than is necessary for two screens. Nail to opposite ends of each screen. Stretch and nail the other ends. Then cut screen.



retails for \$1.85

A sturdy 6 foot wood rule with an extendable 6" solid brass insert for short extra measuring chores. The X-6 eliminates guess work, gives exact, accurate inside measurements every time. Simply expand the rule to closest measurement possible, slide out the brass insert with free hand. A spring catch keeps the slide rigid in the extended position. Figures and graduations are etched in the extension, will never wear off.

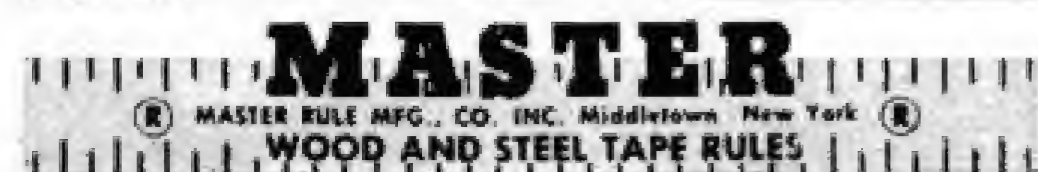
## AS A SERVICE TO YOU:

Each month we will print the finest building short-cuts used by professionals and amateurs. You'll want to keep a scrap book or file for these handy references. IF YOU HAVE A SHORT-CUT YOU CAN WIN A PRIZE! Send it to "HOW TO," care of Master Rule Co., Mulberry Street, Middletown, F4, N. Y. If we use it, we will send you, free of charge, your choice of any wood or steel rule in the Master line. All entries become the property of Master Rule Co. and will not be returned.



Please send literature ☐. I am enclosing a "HOW TO" item ☐. If you use it, please send me a \_\_\_\_\_ rule.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_



(Continued from page 218)

to expose new wood. You did not say what type of piece you are referring to which makes it difficult for us to tell you how to proceed. However, in a general way, we'd first try scraping with a cabinet scraper to expose new wood. If this works out and the wood turns up a fairly uniform color, then give all surfaces a thorough sanding. Now mix paste white lead, 3 parts, and fine silica, 1 part. Thin the mixture with equal parts of turpentine and japan, to the consistency of heavy cream. Tint to an old-ivory color, then apply to the wood with a paintbrush. Just as the material begins to set, rub off across the grain as you would a filler. After rubbing across the grain, rub lightly with the grain until the wood is the color you desire. Allow to dry for 10 days, then finish with paste wax. This finish is only one of several, but in some ways is the simplest to apply. It also is quite effective on woods other than pine.

## Stoker Problem

Q—During the last heating season I had trouble with my stoker. The main difficulty was in removing the clinker which always seemed to form deep in the firebox. My neighbor said that there was too much air, but adjustment didn't appear to make any difference. Can you tell me what is wrong and how I should remedy the trouble?—A. N., Ill.

A—We think your neighbor is at least partially right. The fact that the fire burns continually lower would indicate not only too much air but a thin fire due to a coal feed set too slow. This in turn lowers the plastic zone—the point where the coal is reduced to a state of plasticity in the process of combustion—thinning the fuel bed continually and resulting in the formation of a clinker deep in the retort. Judging from your description of the problem, we believe you should adjust the air and coal feed and also check the operation of the damper and the hold-fire control. Correct adjustment of the hold-fire unit is especially important. Most stokers of the later types are equipped with hold-fire units operated by an electric time clock, but some are equipped with a stack-type thermostatic control. The former has two adjustments, one governing the frequency of stoker operation during a hold-fire period in mild weather, the other, the time the stoker will run during each separate operation. These adjustments determine the hold-fire cycle. The latter-type control operates by stack temperature and both types are quite flexible. Satisfactory operation of the stoker depends to a great extent on the proper adjustment of the hold-fire control, especially when different types and grades of stoker coal are used. Of course, the proper functioning of all units of the heating system must be correlated in order to obtain the best results. This means adjustment of the fuel-and-air ratio, proper cleaning of the fire at regular intervals, correct adjustment of the firebox draft with the atmospheric damper, and adjustment of the hold-fire control.

## Chalking Paint

Q—I'm advised to use a self-cleaning paint on my house. What is this product?—T. A., Ore.

A—Probably you are referring to the so-called chalking paint which, stated simply, is a paint for outside use containing certain ingredients that permit what might be termed a slow disintegration of the paint film at the surface. This process continually releases particles of pigment which are washed away, carrying with them accumulations of the dust and grime that cause discoloration of the walls. Because of this, such paints are sometimes referred to as self-cleaning. This feature of the paint appeals to homeowners located in areas where house paint is subjected to discoloration due to dust and other causes.



# "13 cross-country trips and she's still singing sweet!"



**"Sure, I've had to use replacement parts! But not often—  
because I've always insisted on GENUINE FORD PARTS!"**



**They're made right to fit right** because they are made exactly to Ford specifications—by the men who designed and built your Ford. So they're easy to install—save repair time.



**They're Track Tested and proved** in the most punishing tests imaginable by Ford engineers before they win the Genuine Ford Parts label. They're *really* built to take it.

**They're easy to get, too!**  
They're available at all Ford Dealers and the selected independent garages where you see this sign.



**Keep your Ford ALL Ford**



"Handy" SANDY says:



Save work with these

**GOOD  
SHORT-CUTS**

... clip and save 'em!

You can make a small file in a jiffy—to remove metal burrs, clean up metal surfaces, or sharpen tools. Take a sheet of Emery Cloth and tear a strip from it—the 11" way. Tack or cement the strip to a stick of wood the size of the file you need, and go to work! If you're cleaning or sharpening with it, try squirting a little lubricating oil on the surface or edge you're working on. Gives a finer finish—and, if you're filing plastics or soft metals, the oil keeps your "file" from clogging up. Emery Cloth, a top-notch product by CARBORUNDUM, comes in grit sizes from #3 (very coarse) to #3/0 (fine). Get it at your hardware or lumber dealer's.

Keep your work-piece from slipping in the vise when you're filing or drilling holes. It's no problem—just wrap a piece of Flint Paper by CARBORUNDUM around the work piece (grain side out). Put it in the vise and tighten 'er up. This just proves my point that you should always have CARBORUNDUM's Flint Paper on hand—it's useful in so many different ways.

A lot of folks don't realize that grinding wheels are actually made by CARBORUNDUM thin enough to saw metal. Industry uses millions of them each year—calls 'em "cut-off wheels," for that's exactly what they do. They're getting more and more popular in home workshops, too, because you don't need any special equipment to use this type of wheel. It's made to fit your bench saw, grinder or portable saw. Want to cut steel, aluminum, brass, bronze, copper—in a jiffy? Just replace your rotary saw or grinding wheel with an "MX" Aluminum Oxide Cut-Off Wheel. What's more, you can use the side of this "MX" Cut-Off Wheel to sharpen or finish grind your edge tools, cutlery, chisels, planer knives, drills and other hand tools. Want to cut plastics, fiberboard, hardboard, asbestos, and such, too? An "MX" Silicon Carbide Wheel will cut them all. "MX" Cut-Off Wheels by CARBORUNDUM are strongly reinforced for top safety—yet they are flexible. They cut fast, and finish as they cut. You just can't beat them as worksavers! Better get a pair today from your hardware or lumber dealer... Aluminum Oxide (for metals) in the red envelope—Silicon Carbide (for non-metallies) in the green envelope.

My boss will send you \$5.00 for each home or workshop short-cut you send me, provided I can use it in my column. Send one idea on a postcard. Even if I can't use it (because of duplicates, and such) I'll send you a useful gift for your trouble, anyhow.

Send for a new free pamphlet. It's called "HOW TO SAND." The CARBORUNDUM folks want you to have it—without charge. Ask for it on a separate postcard addressed to me.



**"Handy" SANDY  
CARBORUNDUM**

Niagara Falls, New York

"CARBORUNDUM" AND "MX" ARE REGISTERED TRADEMARKS  
OF THE CARBORUNDUM COMPANY, NIAGARA FALLS, NEW YORK

## Those Fabulous Flying Fords

(Continued from page 69)

aerial cavalcade was staged into northern Michigan. One day, at a small landing field, the wind died suddenly and nothing could get off the ground—nothing, that is, except the Ford. Stout asked the pilot later how he did it.

The pilot was a man of few and picturesque words. He explained it thus:

"I says to my mechanic, 'Hold the brakes,' and he held the brakes. I opened the throttle and I says, 'Let 'er go. Either she does or she doesn't.'

"She did."

The Ford even altered the Army's ideas about airplanes. In those days the Army insisted that cockpits be placed back toward the tail, to give the pilot a chance of survival in case of a crash. All its pursuit planes were built that way. Then something happened to change the Army's mind.

A squadron took off from Detroit for Seattle. A Ford went along with mechanics and tools. The pursuit pilots presumed that the big, sluggish Tri-Motor would trail far behind. Instead, the Ford reached Seattle three days ahead of them. Snowstorms had grounded the pursuits because the pilots, perched far aft along the fuselage, had no visibility. The Ford, with its cockpit up front, plowed on through.

Shortly afterward the Army began shoving its cockpits forward.

The Ford rang up another "first" by carrying Admiral Byrd to the South Pole, with Bernt Balchen at the controls. Only by tossing out 250 pounds of precious provisions were Balchen and Byrd able to squeak the indomitable Tri-Motor over one towering mountain barrier. That famous ship is now on exhibition in the Ford Museum at Dearborn.

Recently two incidents have given Stout renewed pride in his rugged offspring.

One involved a package received in the mail, containing a piece of corrugated metal. With it came a letter from an Air Force general.

He said the piece of corrugated metal was cut from the tail of a Ford Tri-Motor. The plane—then 15 years old and long obsolete—was used to evacuate civilians off Bataan peninsula in the Philippines in that fateful year of 1942. Designed originally for 14 people and a 250-mile range, the plucky old crate was lurching off the ground with 24 people aboard and flying 500 miles over water twice a day. The Japanese finally strafed it and left it a heap of rubble and the Air Force general salvaged a piece from the tail.

(Continued to page 224)



# Texaco Tips



## on car care



### How to keep your engine running cool

When your engine overheats—it means trouble. To keep it operating at the right temperature, see your Texaco Dealer. He will check for rust, draining and cleaning the radiator if necessary. If the fan belt or water hoses show signs of wear, they will be replaced. He will check water pump; drain cocks, gaskets and cylinder head bolts for leaks. See your Texaco Dealer—the best friend your car ever had.



### How to get that "cushiony" ride

Here's proof of why Marfak gives your car top chassis protection. Rub Marfak with your finger—it forms a tough, fluid film and builds up a "collar" to seal out road grit and grime. And Marfak stays put . . . clings to bearings and points of wear.

Marfak's longer lasting protection means cushiony riding ease for 1,000 miles or more. For Marfak lubrication, see your Texaco Dealer.

**THAT "CUSHIONY" FEELING  
LASTS LONGER WITH**



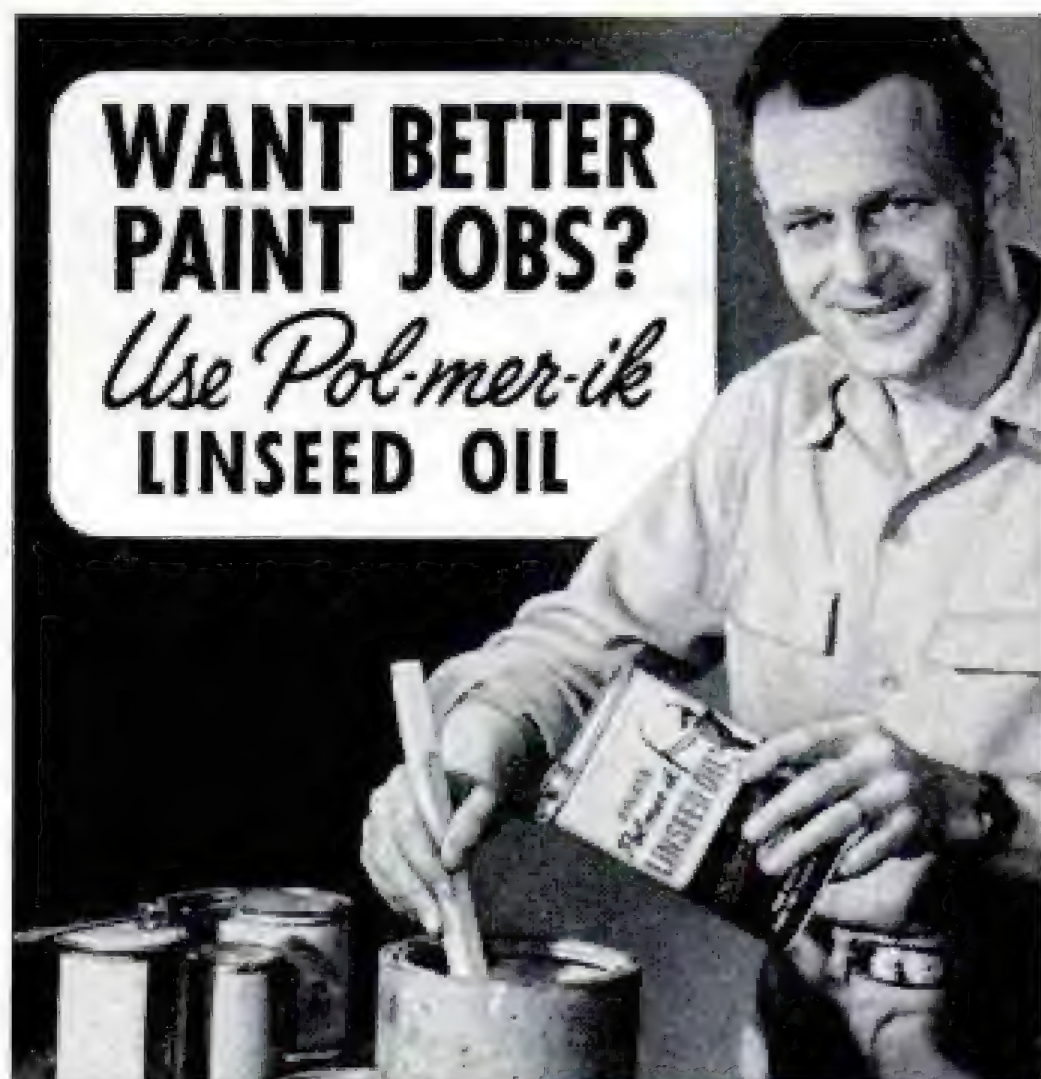
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**TEXACO DEALERS IN ALL 48 STATES**

*Texaco Products are also distributed in Canada and in Latin America*



# WANT BETTER PAINT JOBS?

Use *Pol-mer-ik*  
LINSEED OIL



• For years Archer Pol-mer-ik has been the linseed oil chosen by more professional painters than any other for paint reducing and brush conditioning. Pol-mer-ik has been

*super-treated* by a special polymerization process which reshuffles the oil molecules so they are interlocked. This gives you a tougher, more durable paint film than ordinary linseed oil. When you reduce your paints with Pol-mer-ik, they brush out easier, level out better, have a smoother, more dirt-resistant surface, and give you a longer-lasting job! Next time you paint, use Archer Pol-mer-ik Linseed Oil. You'll get better results!

BRUSHES OUT  
BETTER

TOUGHER  
SURFACE

BETTER GLOSS

**ARCHER**  
*Pol-mer-ik*  
**LINSEED OIL**

**PROTECTS MOST ANYTHING**



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**101**  
HANDY USES:

- Preserves tools and handles.
- Refinishes antiques.
- For natural wood finishes.
- Softens stiff putty.

Yes, Archer Pol-mer-ik is a real Handy-Andy helper that saves you time and money by doing the job of a dozen specialized products. The handiest single product in your home!

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603 Roanoke Building, Minneapolis, Minnesota

The other incident occurred not long ago. Williams took Stout for a ride in his Ford and I went along as a passenger. It was a sentimental journey for me, too. The first airplane in which I ever flew—back in 1935—was a barnstormer's Ford Tri-Motor. Since then I have flown in everything from aerial flivvers to jets. I came full circle that day when Stout and I went aloft in Williams' treasured old Ford.

Stout, too, must have felt a charge of emotion. "Darn, this takes me back," he exclaimed as we climbed aboard.

Williams taxied out on his private dirt strip to take-off position, just abreast of a tall cottonwood tree. From the copilot's seat I could see another big tree at the far end of the strip. "From here to there is a quarter mile," Williams said as he warmed the engines. "We'll need only about half that distance to get off."

The big Ford rumbled into motion, gained speed and hopped into the air almost like a helicopter. By the time we came abreast of the second tree, we were 25 feet above its topmost branches.

While we flew at a pokey 90 miles per hour, I reflected on the contrast between air transport in the 1920s and as we know it now. The low wing of the modern airliner is an annoying obstruction to the sight-seeing passenger, but the Ford's high, bridge-like wing yielded a wholly unimpeded view of everything around us. And the plane had wide, airy windows instead of the tiny airliner portholes that give today's travelers only a tantalizing glimpse of scenery. Against my ears pounded the thunder of the engines. For the Ford there were no such fripperies as soundproofed walls.

At a little mountain cow town called Payson, we landed on a strip that no other transport the size of the Ford would have dared to use. The Ford, with its slow landing speed, rolled to a stop before it had traveled half the strip's length.

Out of Payson, Bill Stout himself took the controls. He said he hadn't flown a Ford in 10 years. Williams paid him a pilot's finest tribute: He stepped back out of the cockpit and let Stout go it alone. Bill Stout wore a grin like a kid on his first airplane ride.

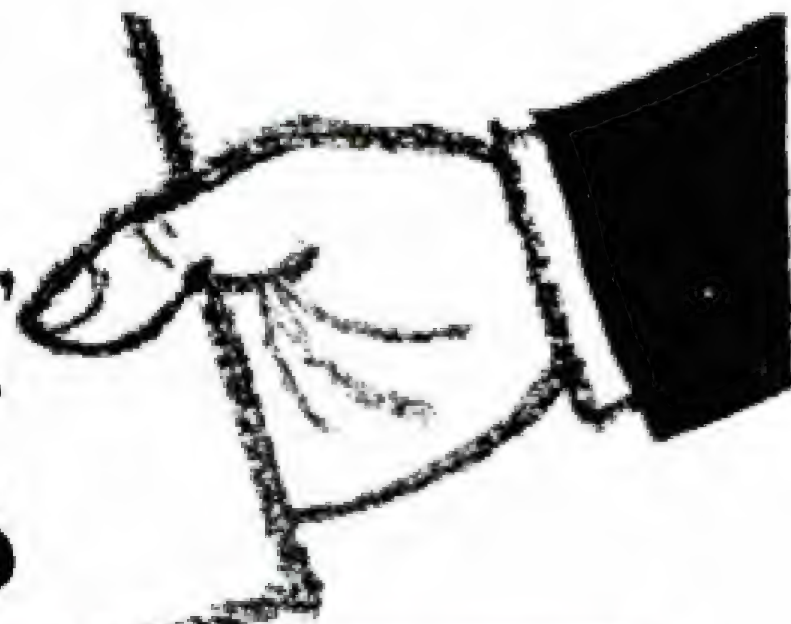
Three quarters of an hour later Stout climbed out and gave the Tri-Motor a last proud look. "Those Fords will fly as long as anyone wants to fly them," he said.

Today, in the United States and in obscure places all around the world, people are taking Bill Stout at his word. Come war or peace, jets, rockets or guided missiles, the unconquerable old Ford Tri-Motor flies on—an airplane that is too tough to die.

★ ★ ★



# YOU CAN WIN A "SUGGESTION BOX" BONUS



**"Company pays \$1200 for cost-cutting idea!"**  
**"Employee wins \$350 for suggestion!"** Ever wonder how *you* can cash in on *your* company's suggestion system? Check these Bostitch case histories. There may be an idea here for *you* — and *your* company.

**BUSINESS:** Cabinetmaker

**SUGGESTION:** Fasten bottoms and sides of small chests with Bostitch foot-powered stapling machine and  $\frac{3}{8}$ " staples.

**RESULTS:** Five times faster than old method of nailing. Stapling more secure. Workers like it better.

**BUSINESS:** Gasoline Pump Manufacturer

**SUGGESTION:** Instead of solder, use  $\frac{3}{8}$ " staples to fasten No. 8 mesh on foot valve bottom of pump.

**RESULTS:** Production jumped from 20 an hour by soldering to 90 an hour with Bostitch.

**BUSINESS:** Tile Contractor

**SUGGESTION:** Instead of nailing metal lath to wood studs and joists, use Bostitch hammers and tackers.

**RESULTS:** One man can now lath 4 bathrooms in  $2\frac{1}{2}$  hours compared to 5 hours the old way.

**BUSINESS:** Garage Door Manufacturer

**SUGGESTION:** Metal stitch aluminum panels together with Bostitch wire stitcher. Old method: drill and screw.

**RESULTS:** Plant turns out 500 doors a day as against 50 before. Stitcher and special table jigs for positioning panels save space, material.

**BUSINESS:** Vacuum Cleaner Manufacturer

**SUGGESTION:** To fasten metal discs inside fiber cylinders, use Bostitch metal stitcher instead of punching holes and riveting.

**RESULTS:** Manufacturer saved \$6250 the first year.

**BUSINESS:** Frozen Food Locker

**SUGGESTION:** Replace cellophane tape with Bostitch desk-type stapler for fastening ends of frozen food packages.

**RESULTS:** Labor and material costs cut 50%. Bostitch method gives tight, permanent seal. Unlike tape, will not loosen at low temperatures.

**TO HELP YOU** find ways to apply Bostitch savings to *your* business, send for the 16-page illustrated booklet, "Time and Money-Saving Case Histories." It's *free*—and full of cost-cutting ideas!

**BOSTITCH®**  
*AND FASTER*  
 fastens it better <sub>1</sub> with wire

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Please send me a free copy of the Bostitch book of case histories.

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City \_\_\_\_\_ State \_\_\_\_\_

Company \_\_\_\_\_ Position \_\_\_\_\_



# Here's how for home painters



**Handy container!** A gallon paint can is awkward to handle. Here is a hand-size container made from a coffee can. Stiff wire, run through holes punched in the edge, gives you a place to wipe the brush without having paint running down the outside. For touching up trim, Devoe Trim & Shutter Colors brush easily, cover in one coat.



**When painting basement, test for dryness to insure good job!** For walls: seal a 1-foot square of cellophane to wall with adhesive tape. No moisture droplets under cellophane after 2 days means okay to paint. For concrete floors: throw down a solid rubber mat for 2 or 3 days. If no moisture is on underside, go ahead and paint.



**Save time, temper, and paint remover!** When removing paint from furniture, catch excess paint remover in can cover or shallow pan placed under furniture leg. Remover can be re-used and the work area will be kept clean. When repainting furniture, be sure and use Devoe Mirrolac Enamel—it's easy to apply, leaves no brush marks, and is extremely fast-drying.



**Splatter control!** Now—no more splatter when you hammer the lid back on a paint can. Secret: place a cloth over lid to catch the splatter while you hammer. Another trick: punch nail holes in rim channel. Paint simply trickles back.

**When repainting your house, use Devoe Wonder-1-Coat House Paint . . . gives 2-coat beauty and protection in just one coat, cuts repainting time and costs practically in half. Your Devoe dealer (in Classified Phone Book) will be glad to help you with all your painting needs.**

**DEVOE**  
PAINT

REPLACE YOUR OLD WORN  
OUT CHUCK WITH A



- ENTIRE CHUCK BODY HARDENED
- JAWS NICKEL CHROME MOLY ALLOY STEEL
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**FREE  
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Specify boat kit,  
size and make.

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**NEW! EASY  
WAY TO CLEAN  
WHITE TIRES**



This amazing new compound (not a paint) gets dirtiest whitewall tires snowy-white-as-new! Just wet the tire, spray with SPRAY WHITE, swish suds around... and rinse. No scrubbing or abrasives needed. Harmless to hands, tires. Bottle cleans 50 tires: \$1.00, sprayer included, post-paid. **MONEY BACK GUARANTEE.**

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Costs Less To Begin With! Aristoflex—in economical standard gauge — is produced especially by MATICO to meet the needs of homeowners everywhere. It resists dirt, grease, acid and alkali... stays sparkling clean with occasional damp moppings... is quiet and comfortable underfoot... comes in 13 radiant Coronation Colors... lasts for years and years. Best of all, Aristoflex costs less than any other flooring of comparable quality... gives you far more for your money. See Aristoflex at your friendly MATICO dealer — he's listed in your local classified telephone directory!



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**ARISTOFLEX yourself**  
**SAVE STILL MORE!**

Yes, you can save \$25, \$30 or more on every room by installing Aristoflex yourself. It's easy, too, with MATICO's tested install-it-yourself method—special tool kit—and illustrated instruction booklet. And you can install Aristoflex in any room from basement to attic because it's rugged vinyl-plastic throughout — there's no felt backing to wear off or deteriorate.



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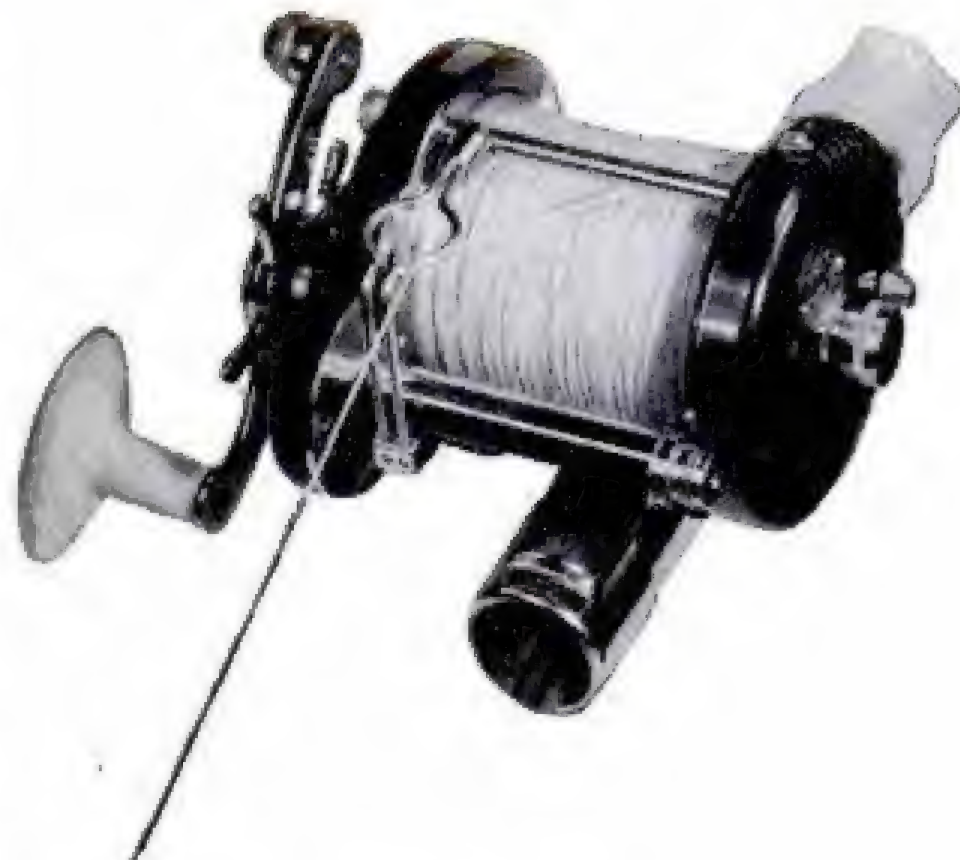






## Waterproof Belt for Fish Lures

Anglers carry their lures conveniently at hand when they "wear" them around the waist in a new waterproof carrier. Made of waterproof Velon, the carrier fits on an ordinary belt and has nine pockets of various sizes. Each pocket contains a waterproof plastic vial and the entire carrier weighs less than 10 ounces.



## Stationary Line Guide Permits Easy Casting

Aiding casting distance, a simple line guide on a level-winding surf reel permits line to run unimpeded through a large eye in the guide during the cast. Stationary during casting, the guide traverses during the retrieving process. The line feeds back onto the spool through a narrow slot in the guide, lying down uniformly and cleanly. Prepositioning of the guide before casting is unnecessary.

# A Craftsman's Gift for Father's Day!

**DREMEL**

**STRAIGHT-LINE ACTION**

**SANDERS**

**Only DREMEL Offers All These Features:**

**WORLD'S FINEST FINISHING SANDERS** — Patented Straight-Line Action sands with the grain of the wood—eliminates cross grain scratches and orbital swirls.

**MORE SANDING SURFACE PER DOLLAR** means more work done. Faster action (14,400 sanding strokes per min.); more than three times as fast as other type sanders!

**POWERFUL**, high-speed, Lifetime reciprocating motor (110 V, 60 cycle A.C.)

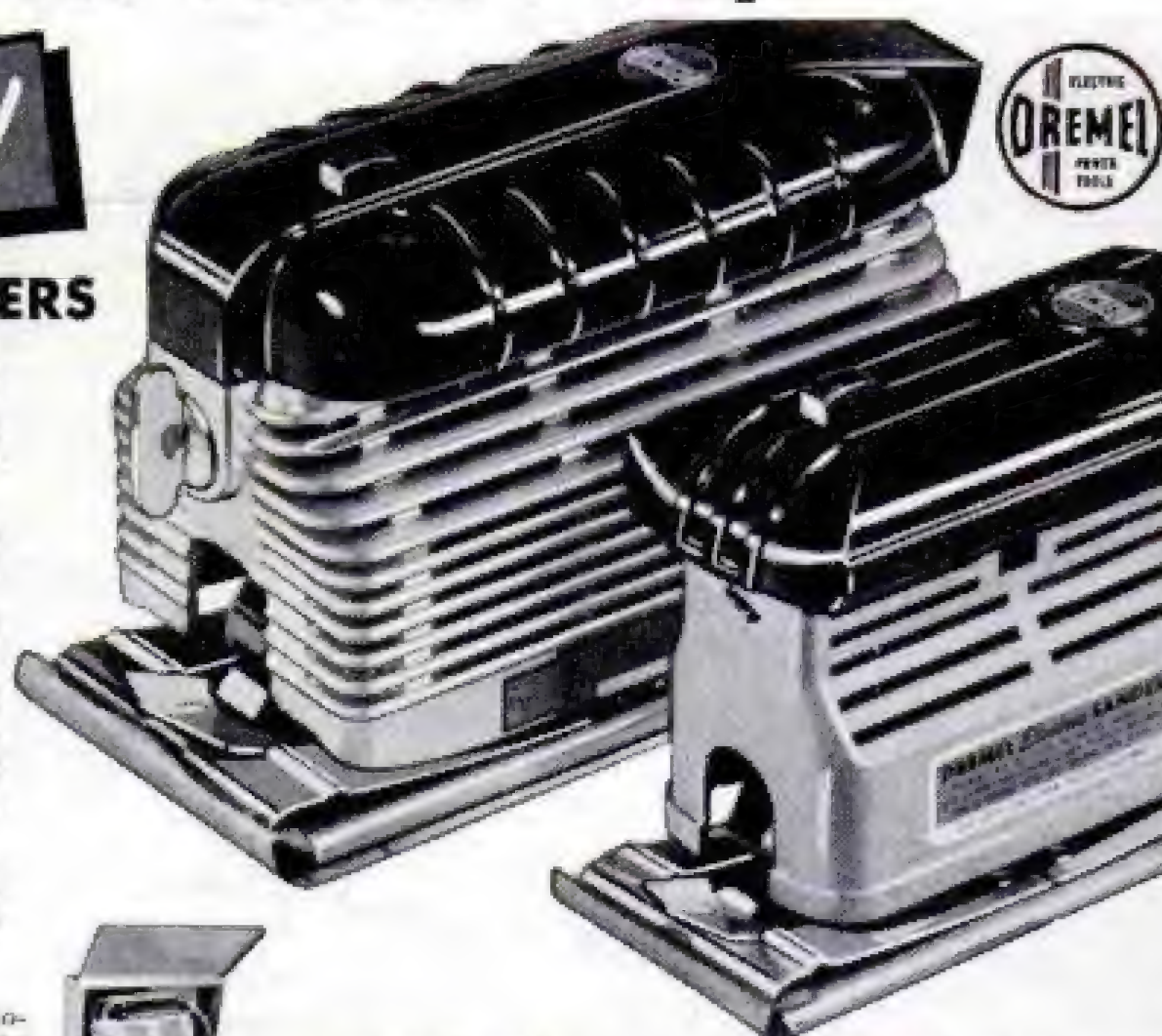
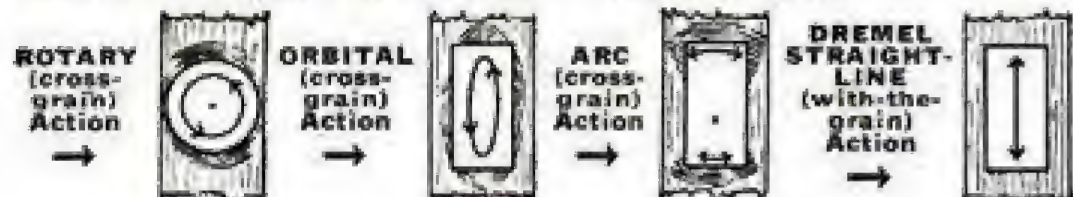
**EASY, ONE-HAND OPERATION** less tiring on vertical and overhead operations. Sands into corners—other tight places.

**TROUBLE-FREE USE** assured. Only two moving parts; never needs oiling. No armatures, brushes, gears or bearings to wear out and replace.

**FREE SANDING GUIDE**—A handy, 16-page "How-to-do-it" booklet containing helpful hints on sanding and refinishing procedures packed FREE with each Dremel Sander. Extra copies, 25c.

**MAKE THIS REVEALING COMPARISON TEST**

Sand a piece of wood by hand, using the four distinct sander motions shown below. Note how small scratches and swirl marks appear whenever the slightest cross-grain motion is used. Now compare these results with the beautiful, satin-smooth, absolutely scratch-free surface produced only by straight-line, with-the-grain sanding. You'll see why we guarantee professional-quality, scratch-free finishes. You'll be convinced that Dremel Straight-Line Action produces the results you want. Try it before you buy!



### MODEL 2000

Heavy-duty model: 21 sq. in. (31 1/2" x 7") sanding base. Price includes sturdy steel storage case, 25 asst'd. abrasives, 1 polishing pad. **\$24.50**

### MODEL "A"

Hobby and household model sander, polisher, massager (above, right): 12 sq. in. (23 1/2" x 5 1/2") sanding base. Price includes 6 abrasives; 1 polishing pad, 1 massage pad. **\$14.85**

**SEE YOUR LOCAL DEALER:** Dremel Tools are sold at better dealers everywhere. If your dealer can't supply, order direct on a five-day trial, money-back guarantee. Remit in full, and we will ship postpaid. Or, send only \$2.00 now, pay postman balance plus postage and C.O.D. fee.

**DREMEL MFG. CO. Dept. 113-F Racine, Wis.**



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...OUT COMES  
LATHER!

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- No Brush Needed
- No Greasy Cream
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Apply Upson Kuver-Krak Panels on furring strips directly over old plaster. In a matter of hours, you have a beautiful new ceiling that is forever crack-proof! No messy replastering! No visible face nailing... because Upson Kuver-Krak Panels

are anchored from the back with "floating fasteners," which allow for normal structural movement.



**NEED MORE ROOM?** Build a storage wall (above)... finish your attic as an extra bedroom, study or playroom. Six-ply laminated Upson Strong-Bilt Panels are easy to work, take nails, screws, fixtures, saw like wood. One coat of paint covers beautifully. For ceilings, use 12-in. sq. Upson Ceiling Tile. Easily applied with matching color pins; washable with soap and water. Other Upson panels available in a variety of lengths, widths, thicknesses. Each marked for specific use.

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I enclose 10c for 32 page Idea Booklet. Include working drawings for Storage Wall.

Name \_\_\_\_\_

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City \_\_\_\_\_ State \_\_\_\_\_



## Owners Report on the '53 Buick V8

(Continued from page 122)

few of the cars had gone over 5000 miles, it was felt that this oil burning may have been due to slow wearing-in of piston rings. Here is the statement from Buick:

"In early production models of its new V8 engine, Buick used a slow-seating ring and during the break-in period the oil consumption in some cars was higher than normal. In many instances, this fault had corrected itself by the time the engine was broken in and the rings had seated themselves properly. Now Buick is using a faster-seating ring in order to avoid excessive oil consumption during the break-in stage."

Other complaints included:

"The 12-volt system burns out light bulbs fast."—Phoenix, Ariz., insurance agent, and others. (However, of all V8 owners, 79 per cent reported they liked the 12-volt system.)

"The hood release is too close to the brake-release button. Several people who have driven my car have pulled the wrong button."—Northville, Mich., civil-service supervisor.

"To park the Super, I have to rotate the

steering wheel many more times than I did on the 1947 Buick."—Brooklyn, N. Y., store manager.

"The steering wheel and horn ring interfere with reading the instrument panel at a glance."—Sabraton, W. Va., molder.

"There is a hum in Dynaflow that sounds just like a car with the rear end gone."—Brooklyn, N. Y., Super owner.

"Would like to be able to see both front fenders."—Nebraska City, Neb., grocer.

"Step-on parking brake is added hazard in stopping and starting on hills, especially on conventional-transmission models."—Portland, Ore., Super owner.

"Step-on brake gets in the way of the dimmer switch."—Harlingen, Tex., pilot.

"Most important item overlooked is the very poor factory inspection. Over 75 per cent of bolts, nuts, screws, etc., were loose."—Kenmore, N. Y., mechanical engineer. (This is a complaint common to all makes today, according to our Owners Reports.)

One interesting reply came from a Buick auto salesman in Illinois. He described the car he sells as "a solid car with good resale value," but said he would like "more change in styling" in his next car.

(Continued to page 234)

### 1953 BUICK SPECIFICATIONS

#### ENGINE

	Special	Super	Roadmaster
Type	Inline 8 OHV	V8 OHV	V8 OHV
Bore and stroke	3 $\frac{1}{8}$ in. x 4 $\frac{1}{8}$ in.	4.0 in x 3.2 in.	4.0 in. x 3.2 in.
Piston displacement	263.3 cu. in.	322 cu. in.	322 cu. in.
Brake horsepower	125 at 3800 r.p.m. standard 130 at 3800 r.p.m. Dynaflow	164 at 4000 r.p.m. standard 170 at 4000 r.p.m. Dynaflow	188 at 4000 r.p.m.
Compression ratio	7.0 : 1 standard 7.6 : 1 Dynaflow	8.0 : 1 standard 8.5 : 1 Dynaflow	8.5 : 1
Transmissions	3-speed conventional standard on Special and Super models, Dynaflow optional. Dynaflow standard on Roadmaster.		

#### GENERAL

Steering ratio (over-all)	29.0 : 1 standard 26.0 : 1 power steering	29.0 : 1 standard 26.0 : 1 power steering	29.0 : 1 standard 26.0 : 1 power steering
Steering, lock to lock	5.25 turns 4.85 power steering	5.25 turns 4.85 power steering	5.25 turns 4.85 power steering
Turning diameter	39.5 ft.	39.5 ft. 41.5 ft. Riviera Sedan	39.5 ft. 41.5 ft. Riviera Sedan
Brakes	Conventional hydraulic with riveted linings, 12-in. drums		
Tire size	7.60 x 15	7.60 x 15	8.00 x 15
Recommended tire pressure	24 lb.	24 lb.	24 lb.
Shipping weight (4-dr.)	3710 lb.	3905 lb.	4100 lb.
Wheelbase	121 $\frac{1}{2}$ in.	125 $\frac{1}{2}$ in.	125 $\frac{1}{2}$ in.
Tread, front	59.1 in.	60.0 in.	60.0 in.
Tread, rear	59.0 in.	62.2 in.	62.2 in.
Height (4-dr.)	65.3 in.	64.8 in.	64.8 in.
Width (4-dr.)	76.0 in.	79.9 in.	79.9 in.
Length (4-dr.)	205.8 in.	207.6 in.	207.6 in.
Road clearance	6.8 in.	211.6 in. Riviera Sedan 6.8 in.	211.6 in. Riviera Sedan 7.0 in.

#### CAPACITIES

Oil	5.5 qt.	6 qt.	6 qt.
Water (with heater)	13.5 qt. standard 15 qt. Dynaflow	18 qt. standard 19.5 qt. Dynaflow	19.5 qt.
Gasoline	19 gal.	19 gal.	19 gal.

#### INTERIOR DIMENSIONS

Front-seat width	63.1 in.	64.5 in.	64.1 in.
Rear-seat width	63.4 in.	64.8 in.	64.3 in.
Headroom, front	35.5 in.	36.3 in.	35.6 in.
Headroom, rear	35.0 in.	35.6 in.	34.8 in.
Legroom, front	43.1 in.	43.2 in.	44.7 in.
Legroom, rear	41.5 in.	43.1 in.	43.4 in.





You'll love Strunk because it's designed for you—for anybody who's got wood to cut (and who hasn't?). Watch a Strunk turn trees into money-making logs, cordwood, fenceposts, or clear ground, trim trees, cut firewood for yourself. No other piece of equipment will pay for itself so quickly!

You'll love Strunk because you won't have to fuss with "gadgets" or complicated parts. The Strunk's reliable engine starts quickly, has a simple one-finger trigger control. Its 28 lbs. handle easily. Its rugged aluminum-and-steel construction will take all the hard wear you can give it! And the Strunk is priced for you—no other manufacturer offers such a top-quality 19" saw for such a low price! Write for our descriptive booklet. We'll tell you where you can buy a money-making Strunk Chain Saw, too!

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**AMAZING, PERMANENT MAGNETS—WILL NOT WEAKEN! NON-ELECTRIC**  
Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from sweeping. Clear alley of harmful tacks, nails. Many other uses. Pays for itself quickly. **GUARANTEED.** Try any magnet one week. Money refunded if you are not well pleased.  
No. M-725 (Weighs 54 oz.) Has pull of 225 lbs. on steel block. \$15.00  
No. M-675 (Weighs 49 oz.) Has pull of 175 lbs. on steel block. \$10.50  
No. M-650 (Weighs 41 oz.) Has pull of 150 lbs. on steel block. \$ 8.50  
No. M-500 (Weighs 15 oz.) Has pull of 50 lbs. on steel block. \$ 4.00  
No. M-30 Hobbyist assortment of six small magnets. \$ 1.50  
Send Money Order or Check. We pay postage. No C.O.D.'s.  
**MIAMI MAGNET COMPANY, 3240 N. W. 27th Ave., Miami 42, Fla.**

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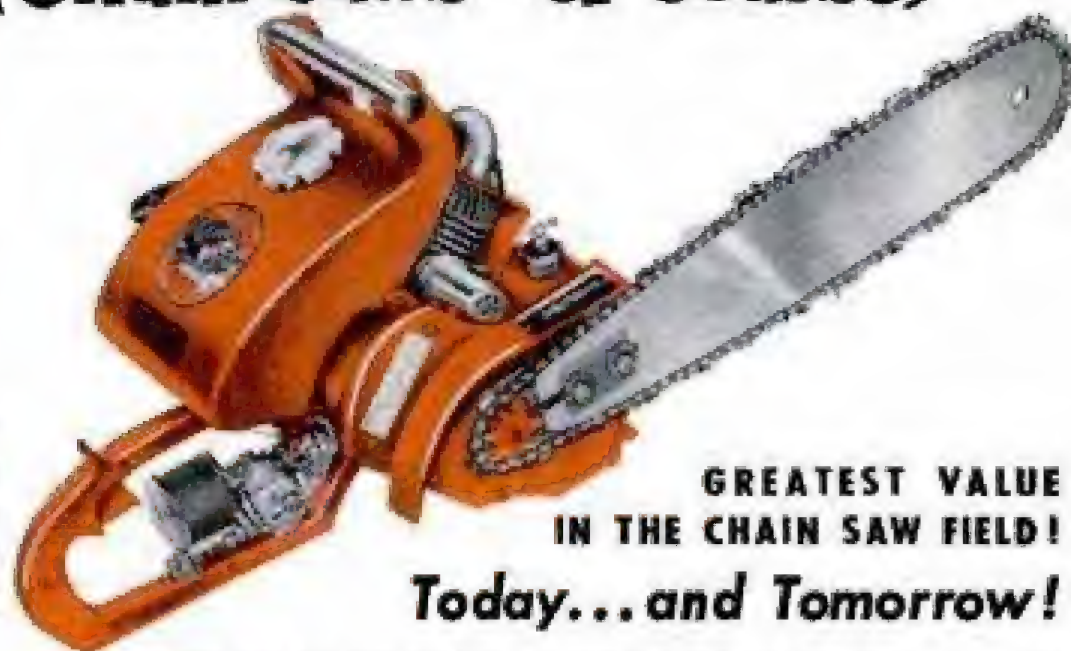
SEE YOUR DEALER! If he cannot supply, order direct for postpaid. Extra cartridges 10 for \$1.

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REG. U.S. PAT. OFF.



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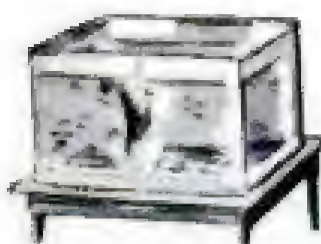
**TORN BASEBALL MITTS** can stay in the game longer when leather is repaired with strong, flexible "Duco" Cement.



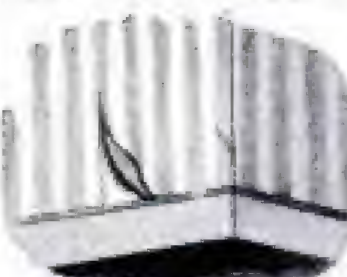
**RIDING A HOBBY?** Maybe you make toys, scale models—build 'em for the fun of it. Use fast-drying "Duco" Cement.



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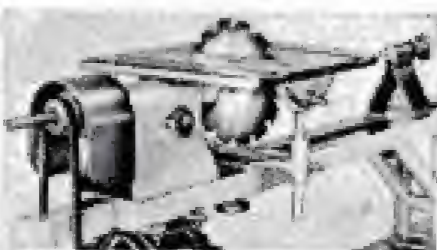
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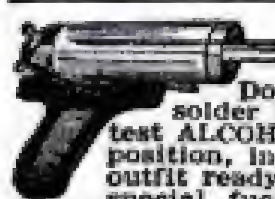
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**SILVER SOLDER TORCH & KIT \$7.95**  
JOINS ALL METALS PERMANENTLY  
Do your own repairing. KIT includes one tube silver solder paste and 40 5-in. lengths silver solder alloy. Hot-test ALCOHOL TORCH known. 2700° F. flame. Operates in any position, indoors or out. Pint of special fuel included. Complete outfit ready for use \$7.95 postpaid. TORCH alone with pint of special fuel \$8.85. KIT alone \$1.65. Instructions included.  
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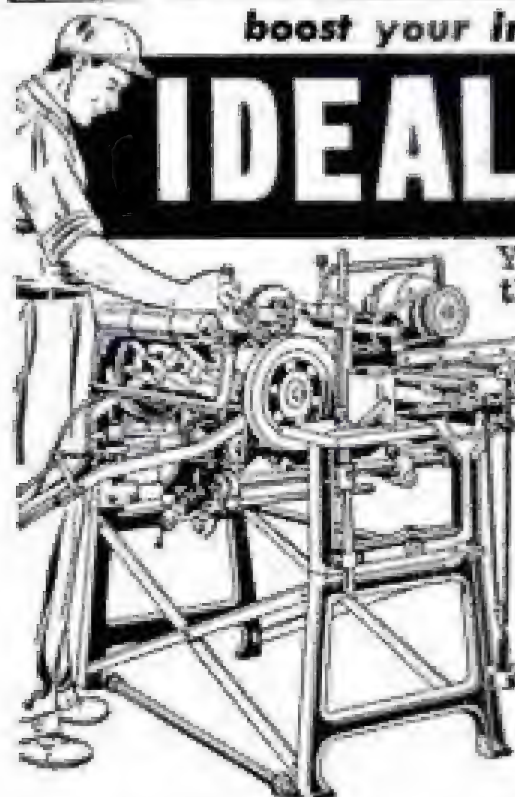
No nails or bolts... use 2x4's for legs. 2x4 or wider for crossbar. Rugged, sturdy, easy to move, saves storage space. Sold by hardware and building material dealers, or order direct.

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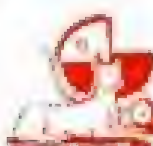
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In this age of scientific progress you are entitled to house paint on your home that provides the *maximum* in lasting beauty and protection. Sherwin-Williams makes SWP House Paint in only *one* grade... the best we know how to make. You benefit four ways when your home is painted with SWP...



**1. LASTING BEAUTY**—When you paint with SWP House Paint in 1953, you can expect longer lasting beauty than ever before.



**2. MAXIMUM PROTECTION**—Building and repair costs today are the highest in history. You want to protect the investment you have in your home. SWP House Paint will give it greater protection than ever before.



**3. LOW COST - PER - YEAR**—The real cost of painting your house is determined by how often you must repaint it. You will find that you have to paint *less frequently* when SWP House Paint is used.



**4. ASSURANCE OF QUALITY**—More homes have been painted with SWP since 1880 than any other brand of house paint. Constant research has kept SWP the world's standard of house paint quality.

Why risk disappointment when you are sure of satisfaction if SWP House Paint is used? There are substitute house paints that sell for less than SWP, but don't let that fool you! *Insist upon SWP, and be sure!*

Write for the free booklet, "The Truth About House Paint"... The Sherwin-Williams Co., 1205 Midland Building, Cleveland 1, Ohio.

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HOUSE PAINT**

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SW-5311



# YOU can make ANY belt driven

★ **TOOL**

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## **WORK BETTER**

**for only  
50¢**

V-belts all start slipping eventually, get squeaky and noisy and fail to deliver FULL POWER from the motor. This slippage is caused by a hard "glaze" that forms on the belt. Cling-Surface dissolves this glaze, returns the belt to its original pliable condition and makes it LAST MUCH LONGER.

Slipping belts on home workshop tools can put nicks and gouges in valuable projects. Slipping belts on cars, washers, dryers and furnace blowers get squeaky and noisy. On your power mower or snow plow, slipping belts only deliver part of the power of the motor and make your job harder to do. NOW . . . you can treat all these belts with one can of Cling-Surface.

*Get it at* your service station,  
auto parts or hardware store.

**MONEY BACK GUARANTEE**



There were many V8 owners, of course, who had no complaints. Some even went further and complained that the Buicks were getting too good! For example, a restaurant owner in Flushing, N. Y., wrote that her complaint was "that they make them prettier every year and I have to keep changing them every year to keep up with the style."

Among the Buick Special owners, complaints were infrequent. The well-tested straight-8 engine has few faults for them. The most frequent complaint was poor gasoline mileage, but that is common for almost all cars.

There were complaints about the small back seat in two-door models. Here is one from a Chrisman, Ill., bank teller: "My car is a two-door hardtop; back-seat room is the same size (very, very limited) as some of the 'dwarf' cars on the market."

Dynaflow noise was also mentioned by a number of Special owners. Another complaint is summed up by a South Dakota retail merchant who is "finding it somewhat difficult to accustom myself to rapid engine speed compared to slow getaway from standing start with Dynaflow."

Poor vision to the rear with the rear-view mirror was also a complaint of some owners of all models.

"I don't like the rear window as you have a hard time seeing a car any distance behind unless it gets right up to your car."—Wisconsin insurance salesman.

"Defroster for the rear window."—Canton, Ohio, mechanic.

"Make the glove compartment more accessible to the driver—possibly in the center of the dash."—from an Evanston, Ill., insurance man.

A number of owners wrote that a light should be added to the Dynaflow selector quadrant.

"Better rear springs. In the '53 models they hold the car too high when it is empty and too low when it is loaded."—Kewanee, Ill., distributor.

A Detroit arc welder wrote: "My Special has tremendous pickup and power and it handles well in traffic or on the road. My only complaint is that road noises seem to telegraph into the interior through the steering column or firewall. The car could be better insulated in the cowl or floor."

Power-steering owners were asked if they felt the accessory was worth the added cost now that they have been using it. As mentioned above, an amazing 21 percent said it was not worth the cost.

There were many others who were enthusiastic about the device. A Coral Gables, Fla., merchant said: "I personally believe

(Continued to page 236)



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End this needless  
expense forever with

**RECLAIMO** Today's most  
advanced OIL RE-REFINING  
filter FOR CARS, TRUCKS,  
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Continuously cleans and RE-  
REFINES motor oil as you  
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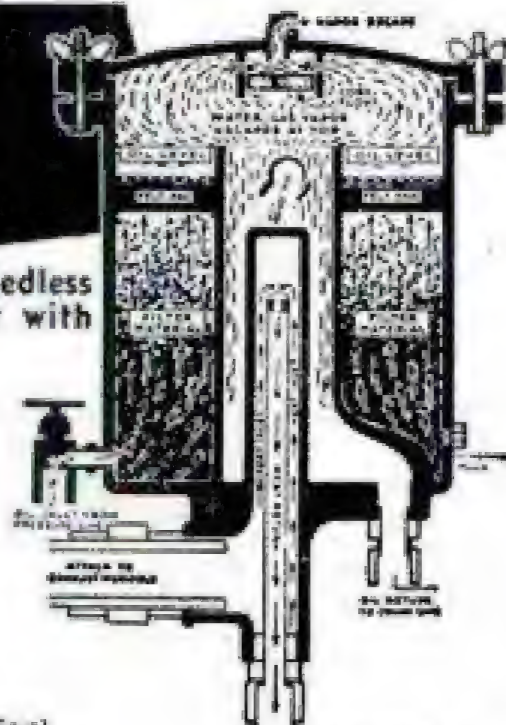
## "RECLAIMO"

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**MAINTAINS** Stable Viscosity **ELIMINATES** All Oil  
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ARDS, Bul. 86  
States, "Oil  
does not wear  
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CHOOSE FROM PROFESSIONAL QUALITY

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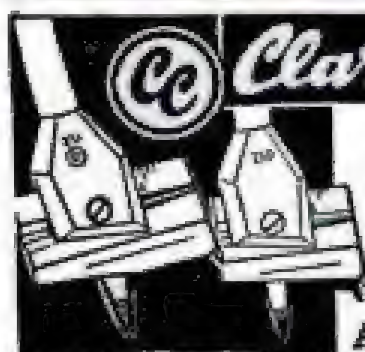
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**UNMATCHED**



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of construction are the sure  
marks of genuine Gerstner  
Chests. Free Catalog.

**GERSTNER TOOL CHESTS**  
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## Clark EXPANSIVE BIT

**CUTS BETTER • COSTS LESS!**

Accurate, fast; cuts smooth holes  
in hard or soft wood. Chrome va-  
nadium steel blades, all chrome  
body. No. 250, 1/2"-1 1/2", \$1.89; No.  
251, 3/8"-3", \$2.19. **GUARANTEED.**

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America's Most Usable  
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Now You Can  
**ENJOY Gardening!**

You'll find fun and healthful re-  
laxation in gardening with ROTO-  
HOE. It was first and it still leads  
with a quality front-tiller power gar-  
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Inexpensive attachments give you year 'round  
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only  
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If your car rides rough, shows  
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Automatically  
adjusts to all  
road and load  
conditions.

**MONROE AUTO EQUIPMENT CO.**

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World's Largest Maker of Ride Control Products



# Hints on How to Refinish Furniture

**Step 1.** Remove old finish—quickly, easily, with fast-acting Strypeeze. Brush on, let it set . . . off comes the old finish. (hint: sprinkle sawdust over Strypeeze. "Roll off" sawdust, Strypeeze and old finish.)



**Step 2.** Fill all holes, nicks — permanently and simply with Savogran Wood Putty. Tools easily, won't shrink. Now, sand entire surface with 6/0 sandpaper. (For cracks in plaster, use Savogran Crack Filler. It's the original patented quick-hardening water putty.)

**Step 3.** Refinish—before you start, be sure brush is clean. Savogran Kwikkeeze really cleans varnish brushes. Leaves no specks of old varnish, dirt in brush to mar finish. Apply stain, thinned shellac seal, then spar varnish or dull "rubbed effect" varnish in finishing.



# SAVOGRAN

**PRODUCTS . . . at better paint & hardware stores**  
**Write for free helpful literature**  
 SAVOGRAN CO., Dept 36, 25 Huntington Ave., Boston 16, Mass.

power steering is the finest improvement made for the motoring public. It takes the labor out of driving a heavy car."

Another plug for power steering came from a soldier stationed in Kansas: "Ease of parking is well worth the additional cost."

But there were some who were not satisfied with the hydraulic steering aid. Here are some of the reasons why they felt it was not worth the added cost:

"Too sensitive on corners." — Chicago businessman.

"Too much noise." — Ridgewood, N. J., accountant.

"Will not straighten out after turning." — Lima, Ohio, businessman.

Average gasoline mileage, according to the owners, is 13.8 miles per gallon for the Special and 12.2 miles per gallon for V8 models in city driving. In country driving, the averages are higher, of course. Owners report 17.0 miles per gallon for the Special and 15.5 miles per gallon for the Super and Roadmaster V8s.

Only two percent of the Special owners said they would not buy another Buick; seven percent of the V8 owners said they would not.

And now for my own test: I drove a Super V8 test car from the factory in Flint, Mich., to Denver, Colo., via Kansas City, a distance of 1525 miles, which included side-road testing en route and still more tests in another Super in California. The models used were four-door sedans.

The Super's new Fireball overhead-valve V8 engine develops 170 horsepower at 4000 revolutions per minute. (The Roadmaster boasts a 188-horsepower V8.) The engine is "over square" inasmuch as the diameter of the bore (4.00 inches) is larger than the length of the stroke (3.20 inches). Such a design lessens travel and wear on pistons and rings.

I gave the Buick a beating for most of the distance. It is a brute for punishment and a car that handles exceptionally well. It has lots of zip due to the combination of the new V8 engine and Twin-Turbine Dynaflow. I rate it as one of the three fastest United States stock cars. A top speed of 113-115 miles per hour by speedometer was hit. Buick's speedometer, like all installed today, is fast by about 8 percent at top speed. Once top speed is reached you can back off on the throttle to about 75 percent opening and still loaf along at 100.

The car was equipped with Buick's power steering. As with all power steering, one is inclined to oversteer (turn the wheel too much), but Buick's has about four pounds' pressure when driving in a straight line and gives a positive feel of the road. Another

(Continued to page 238)

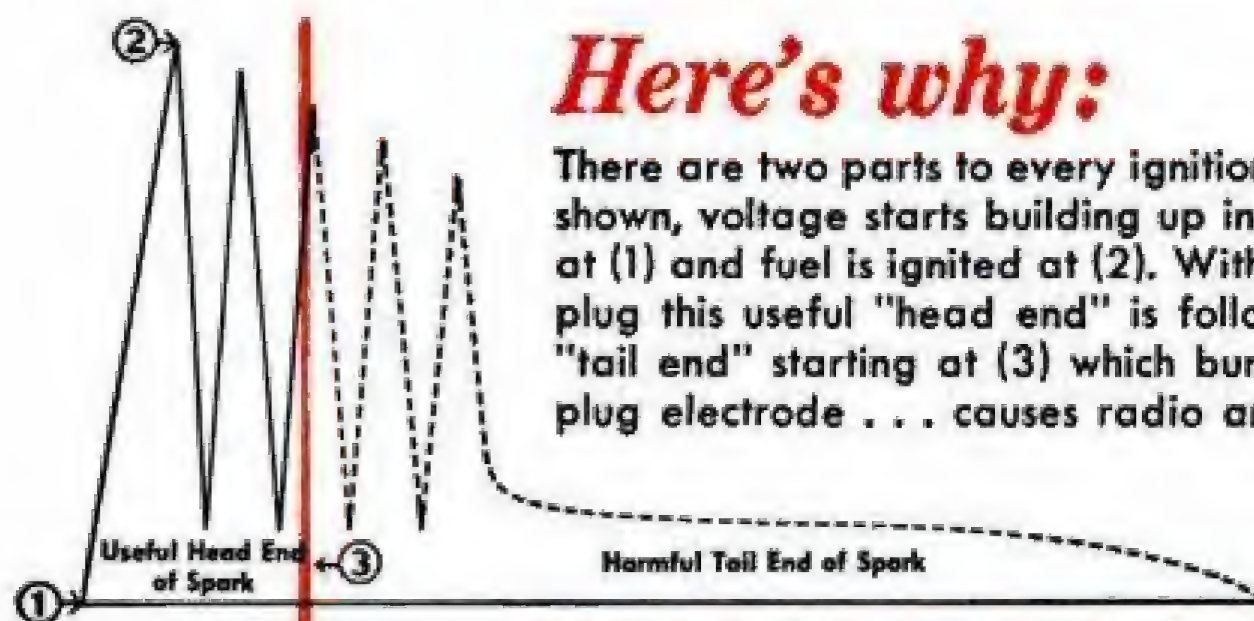


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*Gives you*  
**QUICK STARTS**  
**DOUBLE LIFE**  
**SMOOTHER**  
**PERFORMANCE**

**First Resistor-Type Spark Plug APPROVED AS  
ORIGINAL EQUIPMENT by leading car manufacturers.**

AUTO-LITE SPARK PLUGS—PATENTED U.S.A.



## ***Here's why:***

There are two parts to every ignition spark. In the chart shown, voltage starts building up in the ignition system at (1) and fuel is ignited at (2). With an ordinary spark plug this useful "head end" is followed by a harmful "tail end" starting at (3) which burns away the spark plug electrode . . . causes radio and TV interference.

With the ignition engineered Auto-Lite Resistor Spark Plug there's this difference. The built-in resistor controls the spark. Voltage starts building up in the ignition system at (1), delivers a super-spark to ignite the fuel at (2) for quick starts and smoother performance. But it filters out the harmful "tail end" spark from (3) on to eliminate radio and TV interference . . . protects electrodes to double spark plug life.

Tune in

"SUSPENSE!"

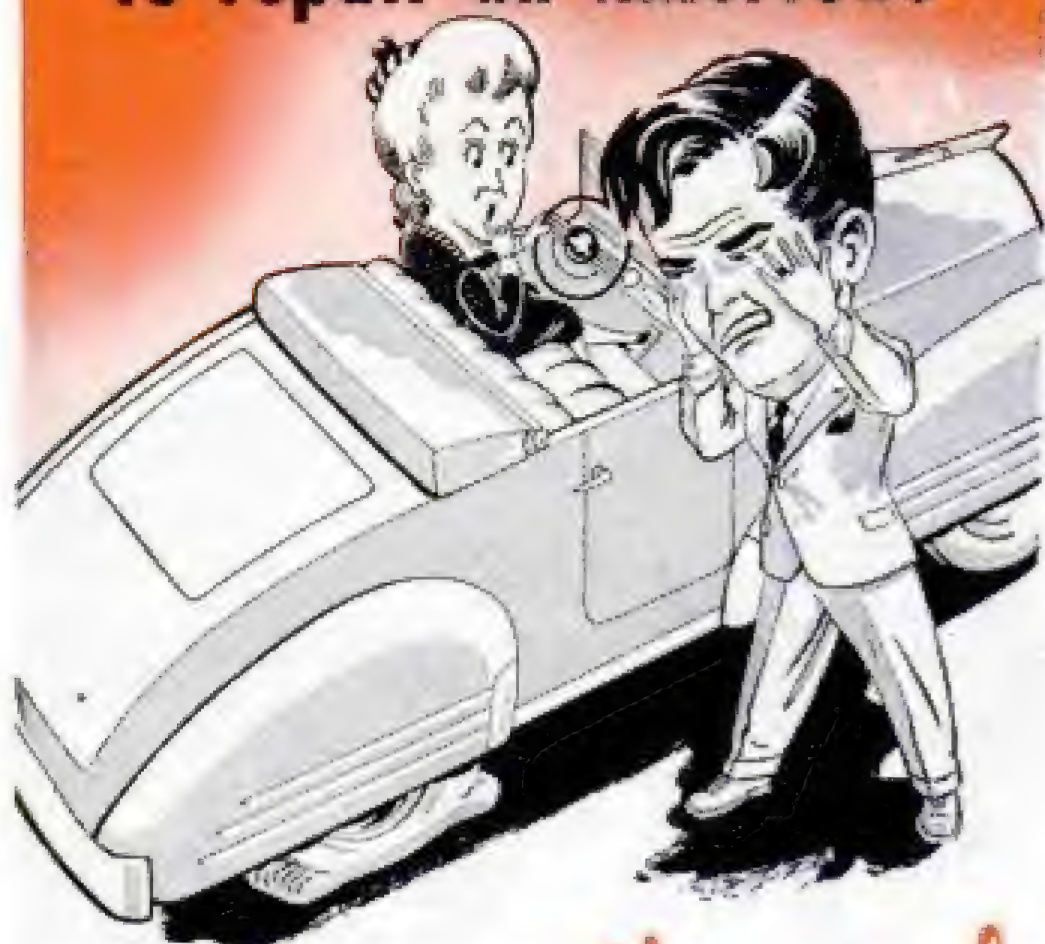
CBS Radio Monday

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**Auto-Lite RESISTOR Spark Plugs are one of a complete line of spark plugs**



There is **ONE**  
**SURE, SAFE Way**  
to repair an innertube



## **BOWES** Chemical **PROCESS** **TUBE REPAIR METHOD**

• There are other methods of tube repair . . . the "cold patch" . . . the "vulcanized patch" . . . and . . . in most cases they work—but

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SURE METHOD . . . Drive In  
Where You See BOWES  
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• When you go to a station that displays the BOWES emblem, you are assured of *Sure, Safe* Tube repairs by the BOWES Chemical Process tube repair method.

Don't take chances . . . look for the BOWES emblem and be **SURE** of **SAFE** tire repairs.

BOWES "SEAL FAST" CORP., INDIANAPOLIS 7, IND.

feature of the Buick is that the wheels straighten themselves after turning a corner. The 4.85 turns of the steering wheel from lock to lock with power steering should be cut to about 4 turns.

Power steering is fascinating to drive and, while many still prefer a car without it, it is here to stay, especially on heavier cars.

For a large American car, the Super handled well on corners. There seems to be less "sponginess" or roll when cornering than in previous Buicks I have tested. The rear end, with torque tube and coil springs, still hops around a little in high-speed cornering. And the tendency to hit bottom on hard bumps when fully loaded is still a Buick characteristic. As regular readers know, I prefer leaf rear springs, although thousands of owners like Buick's rear-end design with its coil springs.

The torque-tube drive transmits the thrust of the wheels directly to the frame of the car, not through the rear springs as in Hotchkiss-drive design. Certainly this makes for a strong rear end, though at times one can feel the movement of the unsprung weight of the torque tube and radius rods that brace the rear axle and torque tube in a rigid T-square lockup, keeping the rear wheels always in true alignment.

The Dynaflow torque converter is greatly improved for 1953. The Twin-Turbine gives faster torque multiplication, and acceleration is much better than in previous years. Coupled to the V8 engine, this unit has increased acceleration from 15 to 26 percent at different speeds from zero to 40 miles per hour over the previous underpowered Super. Dynaflow is the smoothest of automatic transmissions with no evidence of gear changes in acceleration or deceleration.

There still is some "mushiness" when accelerating from zero to 35 miles per hour. However, it is less than in earlier models. This mushiness or slippage is magnified by a rather loud hum during acceleration. Actually, the driver is being fooled. The car is gaining speed much faster than it seems to be (see acceleration chart). Because there is no positive lockup while accelerating, there isn't the sensation of a quick take-off.

Dynaflow drivers can use the transmission for braking when descending steep hills. Place the lever in Low. Even at high speeds there is no downshift jerk when you make the shift as there is in some units.

Dynaflow is so popular that 87 percent of the Buicks for 1952 were so equipped and 82 percent of 1953 owners answering our survey own Dynaflow models.

(Continued to page 240)

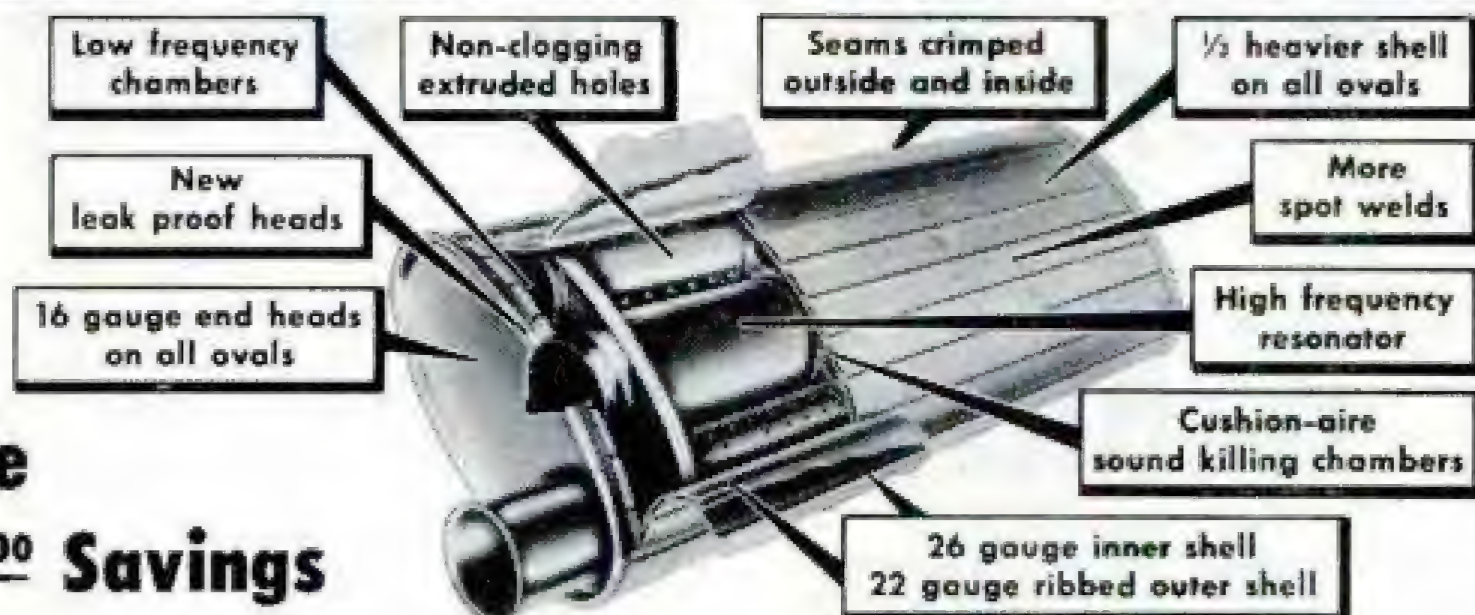


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hear regular broadcasts plus London, Paris, Moscow — ships at sea, aircraft and police calls — amateur broadcasts, emergency frequencies — and much more.

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There should be a light on the indicator quadrant for night driving to show the position of the lever. Low and reverse positions are next to each other, which makes it easy to rock the car in snow or mud.

The Dynaflow-equipped Buick Super has a 322-cubic-inch engine with a compression ratio of 8.5 to 1, higher than ever before. The valves operate vertically instead of at an angle as in typical modern V8 design. The car pings quite a bit on regular gas, which I used for about 800 miles. Premium gas should be used for best performance in the V8. Considering the size of the engine, the weight of the car and the speeds at which I traveled, Buick's gas economy is not bad. Dynaflow owners can waste gas by improper use of the throttle. For quick pickup from zero to 40, it is unnecessary to open the throttle wide. To do so wastes gasoline. The car will take off almost as fast if the driver pushes the throttle wide open for a few feet and then backs off half way.

The hypoid rear-axle ratio of 3.6 (3.9 on regular-transmission models) gives the car a nice cruising ratio, comparable to that of overdrive in some other makes. Hydraulic valve lifters help reduce engine noise.

Despite the complaints of many owners, I found no great oil consumption. I added only one quart of oil on my test of over 1500 miles. Not bad for a new engine!

All 1953 Buicks except the Special have a 12-volt electrical system. The increased voltage gives a hotter, faster spark for high-compression performance and is better suited for the accessory electrical load of modern cars, such as radio, heater and defroster fans, clock and electric windows, to name a few.

The brakes could have a little more pedal "cushion." I am glad to see that a wider brake pedal is used, as I objected to the narrow one when I tested the 1951 Buick. I would rate the brakes as average. With ever-increasing top speeds, engineers should do something about reducing brake fade. Better brakes must come on all makes of cars. Even though power braking makes for easier pedal movement, it is not the answer and something must be done at the wheels to increase braking efficiency at high speeds—and I am not referring to Buick specifically. Brakes are no better on American automobiles today than when cars were 20 miles per hour slower.

Buick continues its unusual step-on parking brake lever that is operated by the left foot. Once accustomed to it, I prefer it to a hand-operated brake. The Buick driver has two foot brakes in an emergency and while using them he can keep both hands on the wheel. The release for the parking brake

(Continued to page 242)



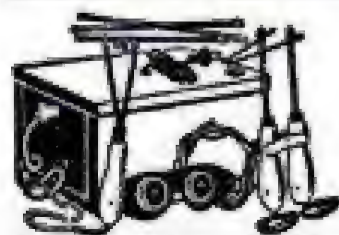
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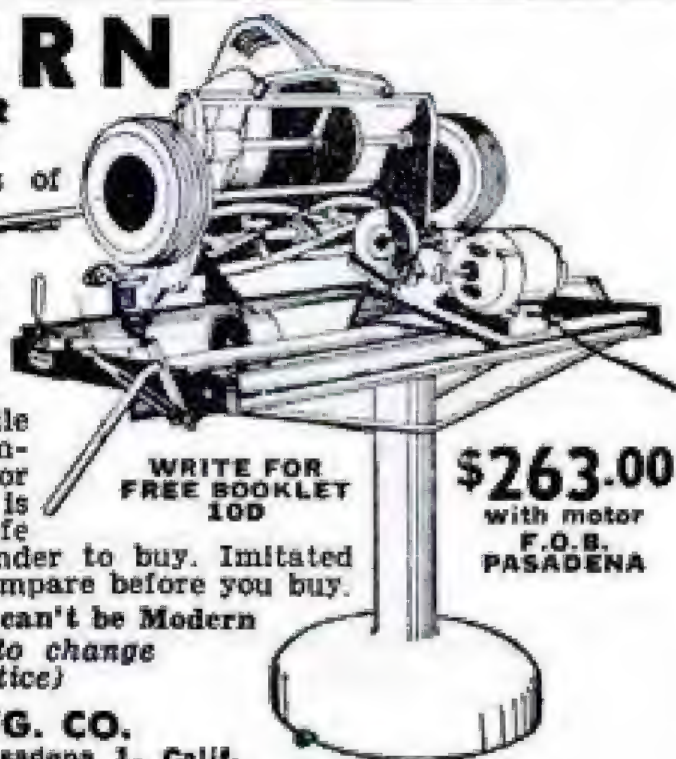


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## How to get more mileage out of your motoring dollar



CHECK OIL PRESSURE

**Glance at your oil gauge** when starting engine, and at intervals while driving. Below-normal reading may indicate

leakage, very dangerously low oil level, or pump trouble. Stop before lubrication failure seriously damages your engine! *Warning:* Your oil gauge can register "normal" even though crankcase oil level is below danger mark.

**Check the oil level whenever you gas up.** Oil level is as vital as oil pressure;

and *only* the dip stick shows you if there's plenty of oil in the crankcase. Oil consumption varies with speed and temperature; and there's always the possibility of leakage. To be safe rather than sorry, check dip stick frequently.



CHECK OIL LEVEL



CHECK OIL FILTER

**Keep a clean Purolator\* Refill on the job.** You need a good filter to keep the road dust, hard carbon and sludge that get into the oil stream from harming delicate engine parts. In time, your filter loads up . . . gets so clogged it can't keep up its money-saving

work. *Before* that happens, get a new Purolator Micronic\*—with 10 times more filtering area than ordinary types. Purolators are specified on more makes of cars than any other filter. Refills cost as little as \$1.60 . . . take just a few minutes to install.

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Check your oil filter every time you change your oil

**PurOlator**  
World's finest OIL FILTER



is too close to the hood-lock release lever.

There has been little change in the Fisher body, which is tight and solid. No squeaks or rattles developed during my test and I found no water leaks. Buick's sweepspear body style, with lots of metal and chrome, does have some practical value in a parking lot when the owner of an adjacent car swings his door recklessly.

The parking and directional lights in front have been moved from the vulnerable spot in the bumper to a location just beneath the headlights. Backup lights remain in the bumper.

Buick's 1953 hood is long and rather high by modern standards and now opens from the front in conventional manner. I prefer this arrangement to the side-hood opening on previous Buicks.

In my previous Buick report I mentioned a dislike for a left-hand-operated switch key. I am glad to see that the key is now operated by the right hand, even though it still can be removed with the engine running, a feature I do not like. The same key is used for doors, ignition and trunk lid—a fine idea.

Interior finish is excellent and foam-rubber seat cushions make a comfortable ride. As on previous Buicks, the massive bumpers offer good protection. Trunk space is large and the self-locking lid opens easily.

The speedometer numerals go up to 120, which is good on a car having the speed of the Super or Roadmaster. One thing I don't like is that the upper portion of the full-circle horn ring is located so that it obstructs the view of the speedometer. I suppose stylists feel that the full-circle horn ring should be used for artistic reasons, but from the practical view the upper portion should be eliminated. The needle also partially obstructs mileage figures.

I have much praise for the new V8 engine and certainly little criticism. I can't say the Dynaflo Buick uses less gas than any similar car I have driven because it doesn't, but with proper use of the throttle, Buick mileage is satisfactory. My average on the test run certainly was.

I found an improvement in Buick's assembly this year over previous models and rate Buick's final assembly and inspection above the average.

By the way, you can get an air conditioner to keep you cool in your new Buick—another extra at \$594! ★ ★ ★

¶Five million deaths and 100,000,000 serious illnesses have been prevented in 10 years by use of DDT in control of insect-borne diseases, according to Edward F. Knipling, president of the American Association of Economic Entomologists.



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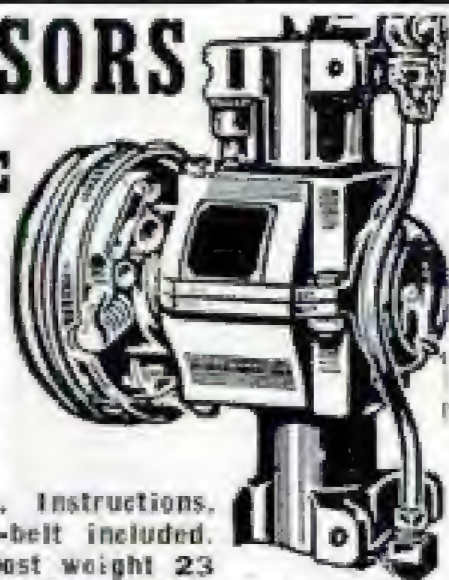
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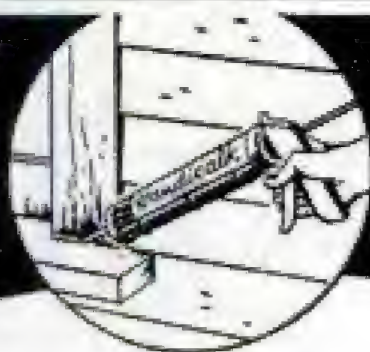
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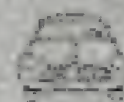
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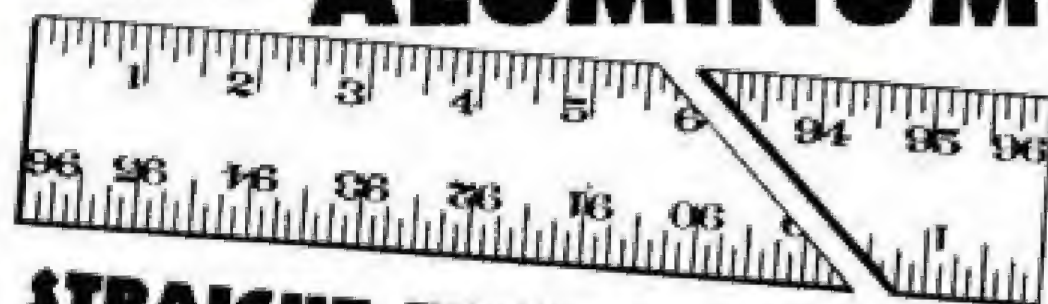
## TV Signal Booster Features

(Continued from page 214)

make certain the tube is lighting properly, and if a voltmeter is available, measure the power-supply output, which should be approximately 150 volts. Now connect the booster to the TV-receiver antenna posts with a short length of 300-ohm line, and connect the antenna twinline to the terminal posts shown in photo B. Be sure that antenna wires do not contact the metal cabinet at any point. Now tune the TV set to a channel on the low end, say 2 or 4 or whatever your low channel happens to be. Next, rotate the dial on the TV booster as far as possible in a counterclockwise direction. Watching the TV screen for "snow" or for an image, adjust the grid-circuit trimmer C1, for best pickup. Do the same with trimmer capacitor C2. A tiny screwdriver is necessary for this purpose. Rotate the dial as far as possible clockwise.

Now set the TV receiver for your highest channel, say 11 or 13. Peak the grid circuit by spreading or contracting the legs of the hairpin inductor L1. Spreading the legs will result in an increase in inductance and a decrease in frequency. Moving the legs closer together will decrease inductance and increase frequency. Repeat the process with loop L2. Once the alignment process is completed, the booster is ready for use. It may be worth-while, however, to repeat the process once again to insure best alignment. *Caution:* a high-frequency unit of this type may refuse to work if there is a poorly soldered connection or a lead is longer than it should be. Extreme care is necessary in wiring the circuit, and the layout should be followed as closely as possible. Detailed student material list R-420 is available from *Popular Mechanics* Radio and Electronics department upon receipt of ordinary letter postage. ★ ★ ★

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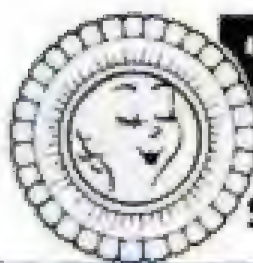
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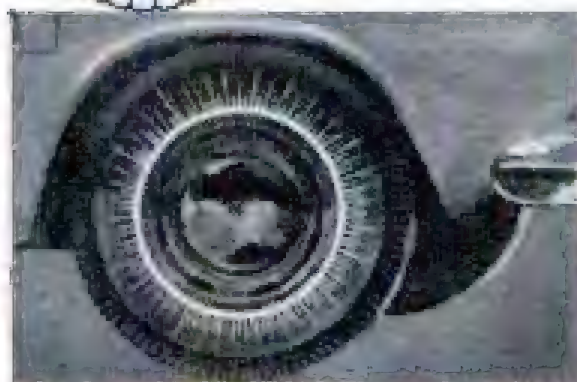
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## Pointers for Home Painters



### Choose the right brush for the job!

When you're painting window frames, screens or other narrow areas, the right brush to use is a sash brush. Sash brushes—either flat or oval-shaped—are designed for the job . . . help you get better results. And a brush with bristles of Du Pont nylon makes trim work easier . . . neater.

When painting windows, protect glass with a piece of cardboard or masking tape. Leave window slightly open during drying, so it won't stick shut.



When painting lattice-work, fences, radiators, always do the hard-to-get-at areas first. This saves you time, trouble and a lot of cleaning up . . . means better work.



When painting edge-wise on narrow surfaces, use a sash brush. It's designed for the job. Using a large brush causes "fingering" (see insert), ruins the brush.



Clean brushes with thinner after daily use. Suspend brush in thinner overnight. Bristle tips should not touch bottom of can. Work out thinner before re-painting.

### For best results use NYLON PAINT BRUSHES

JOB AFTER JOB, you'll get best results with a well-tipped nylon paint brush. Durable Du Pont nylon bristles paint smoother . . . are clean and sanitary . . . never get brittle . . . don't break off even under the roughest treatment. And nylon bristles last from 3 to 5 times longer than ordinary bristles. Leading manufacturers make nylon paint brushes in all types and sizes. Look for the name NYLON on the handle. Be sure to pick the size brush designed for the job.



Better Things for Better Living  
... through Chemistry

The best brushes have  
**DU PONT NYLON  
BRISTLES**

## Lumber From "Toothpicks"

(Continued from page 137)

20-foot-long section than at the other. This growth habit made the Indians favor the trees as supports for their tepees or lodges, which is how the trees were named.

Log houses in the past have been made of logs laid horizontally. The vertical-log buildings are examples of a new technique. The centers of the logs also are bored out to make a four-inch-diameter air space. This helps dry the logs, provides a place for electric wires and also improves the logs' insulating value.

"To cut holes in logs we invented a 6½-foot-long cylindrical bar and cutting head which rotate at high speed," says Stephen Babcock, general manager of the Montana company. "With this we bore holes from both ends of our eight-foot-long house logs in less than a minute."

John Stark, a craftsman living in the western Montana forest, is building lodge-pole-pine furniture without power tools.

He even has to make all of his dowels by hand with a hollow auger used in a regular bit brace. This tool has been out of demand for so long it cannot be found in most hardware catalogues.

Stark selected lodgepole pine for making home, summer-resort and lounge furniture because of the trees' local abundance, ease of working and slight taper. He enlists nature's help in finishing the furniture.

"I season all of my pine logs for about six months with the bark on," he says. "Then I strip off all the bark, but leave on small patches of the living layer (cambium layer) immediately beneath the bark. These patches darken like leopard spots and adhere firmly to the wood upon further drying, even when a wood-oil finish is given to furniture before it leaves the shop."

Lodgepole pine, ignored for centuries by everyone but the Indians, at last is earning its own way in the lumber industry. ★ ★ ★

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## 24 Hours of Speed — Will America Win at Le Mans?

(Continued from page 130)

hopes on two cars built in his small but remarkable automobile factory at West Palm Beach, Fla. The cars will be powered by Chrysler V8 engines again this year. They will have roller cams, special tappets, headers, manifolds, valves and heads. The compression ratio is 7.5:1 and the engines develop well over 300 horsepower on the 80-octane gasoline required at Le Mans.

The Cunninghams have steel-tube frames, special brakes, ultralight bodies and four-speed gearboxes, all engineered by the B. S. Cunningham designers.

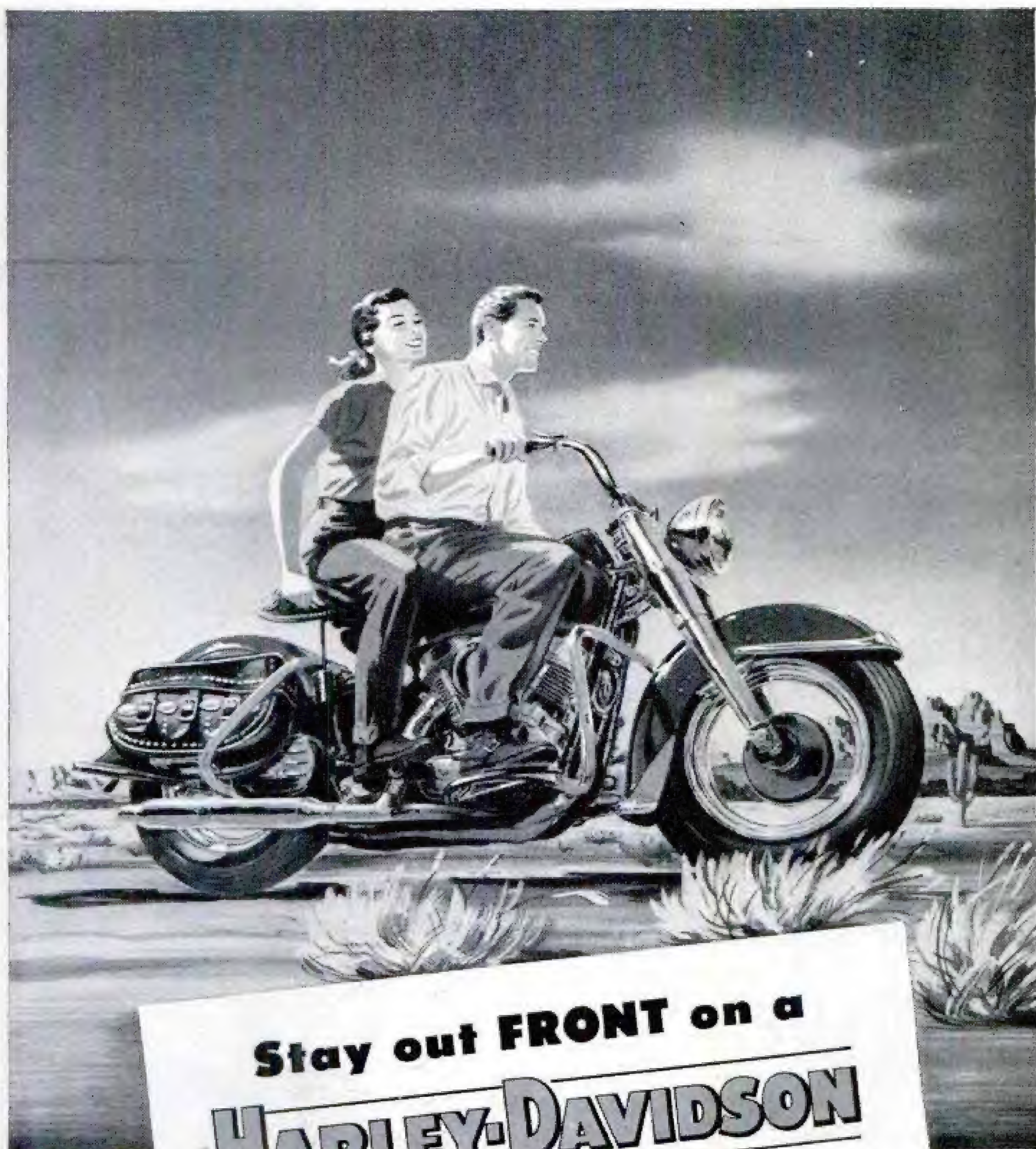
Le Mans 1953 will be Cunningham's fourth try for the sports-car crown. His first, in 1950, was with a car that the French called "The Monster" because of its huge, squat appearance. That year he finished 11th, just behind another of his cars, a souped-up Cadillac with five carburetors and specially cooled brakes. For the following year, Cunningham knew that his cars would have to be lighter and have better brakes. And they should be handsome and well sprung. They were. The four 1951 entries he built cost a total of \$100,000 despite the use of stock parts throughout the special 100-inch-wheelbase frames. These cars were the C2 models. Three entered the race. Only one finished—in 18th position.

When 1952 race day came around, Cunningham was back at Le Mans with three brand-new cars—the C4Rs. One was a coupe, the other two were racy roadsters. All pushed out more than 300 horsepower. But engine trouble forced two out and Cunningham himself brought the third car in to finish fourth with a 24-hour average of 87.8 miles per hour.

And now comes 1953—once again America will attempt to cop the big honor at Le Mans. Other countries and auto companies are in there fighting, too. Proof of the vast importance attached to such a win is evident from the fact that the 1952 German Mercedes-Benz racing team (which won the race) had on the spot 40 mechanics, 5 racing cars (two of them spares) and two trailers completely fitted as workshops. Cunningham himself took 40 men and a reported 40 tons of equipment to France last year. It's the toughest of competitions. Both Cunningham and Nash realize it and will be in there at full throttle.

Winning *les 24 heures du Mans* is the biggest prize of the sports-car year. This year, 1953, may see that prize come to the United States. Only time will tell—24 hours of it at Le Mans. ★ ★ ★





**H**ERE'S more power than you'll ever need . . . power that "steps out" over country highways and "loafs" through city traffic . . . plus luxurious riding comfort that means mile after mile of tireless travel. Yes, the '53 Harley-Davidsons are packed with features to give you more pleasure, greater safety and more

comfort . . . it's the handsomest two-wheeler on the road. See this beauty at your dealer's soon . . . and bring along a buddy. Or, send for your copy of the thrilling, action-filled **ENTHUSIAST** Magazine and illustrated literature. Enclose 10 cents. Harley-Davidson Motor Company, Dept. P, Milwaukee 1, Wisconsin.



## Now They're Hunting Oil With Atomic "Guns"

(Continued from page 91)

of atomic collisions in the Geiger counter held in his other hand, he watches for tell-tale variations in counts that may help paint a picture of a saucer-shaped radioactivity halo on his map. At suspected points, he may dig a trench and stick his instruments right into the soil.

"Getting a true picture is no snap," Scherb explains. "Differences in readings are almost microscopic, even with these supersensitive instruments. All kinds of things can foul up the counts. Bodies of water shield atomic radiations rising from the earth—so do swamps and large outcrops of rock. A small deposit of radioactive ore can send them soaring."

When he has finished his air-and-ground survey with scintillometer and Geiger counters, the geophysicist has just begun.

"There are," explains Scherb, "four kinds of atomic particles flying around us all the time—cosmic particles from space, and three others from the earth. All of the latter three seem associated with oil-bearing formations. There are alpha particles—so weak that they won't penetrate a piece of paper; beta particles that will go through

a thin sheet of aluminum, but not much more; gamma particles so powerful that it takes heavy lead shields to stop them. Sensitive as it is, even the scintillometer provides a good picture of only the gamma radiation."

To get alpha and beta readings, the geophysicist resorts to special tricks. Alpha particles are found in the soil in a radioactive gas called radon. The oil explorer sticks long vacuum tubes into the soil at various points around his suspected oil field, opens petcocks and sucks the gas into the tubes. Back in his laboratory, the gas is run through a Geiger-type tube where its radiations are picked up and counted.

To count the beta rays, prospectors collect tiny soil samples from all over the field, cart them to the laboratory and sprinkle them on tiny metal disks. The disks are shoved into a "castle," which is a lead chamber about the size of a gallon Thermos jug. Inside the castle, a thin aluminum shield or "window" keeps any stray alpha particles from going through to the counter. But the betas manage to get in, and are counted.

If all goes well when he plots his nuclear counts, the geophysicist may find himself with a contour map showing lines of higher radioactivity of all three types surrounding

(Continued to page 252)

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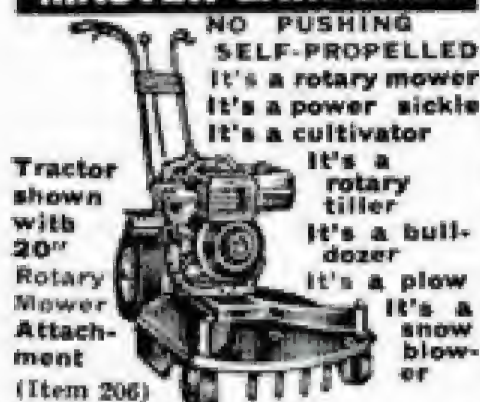
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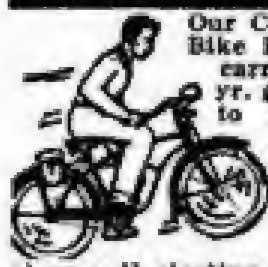
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snow-  
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Where else can you get a power tool that does so many jobs? Works for you year 'round. Does terrific job cutting grass or weeds. Or, prepares mellowed deep seed bed without labor. Built-in power take-off to drive pumps, saws, generators, etc. Safety clutch—can't burn out. More versatile and efficient than tractors costing twice as much. Converts in minutes to Tiller, Power Sickle, etc. Basic self-propelled 2 hp tractor with Briggs or Clinton famous engine. Only \$119.50

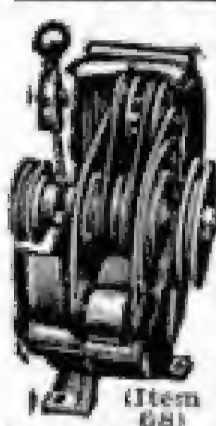
Rotary Lawn Mower.....\$42.50  
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## 3-Pc. ADJUSTABLE WRENCH SET

Made of finest steel alloy, chrome plated. Prices are exactly half actual value. Takes the place of a whole set of tools. Packed in leatherette pouch. Set A—4-inch, 6-inch, and 8-inch wrenches. (Item 107), wt. 2 lbs., only \$2.95  
Set B—8-inch, 10-inch, and 12-inch wrenches. (Item 108), wt. 4 lbs., only \$6.45

## 3-Pc. PIPE WRENCH SET

Made of finest German Tool Steel. Completely drop forged. Pipe sizes clearly marked for easy one-hand setting. Heavy sharp jaws will never slip. Ideal for master craftsmen. Set includes 8"-10" and 14" wrenches. Covers most pipe sizes. A combination of brute strength and precision workmanship. Will pay for themselves on one job. Item 12, Wt. 6 lbs. Easily worth \$11.95. While they last.....\$6.55

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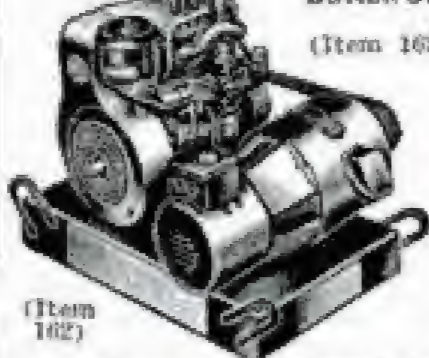
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110/120 v. A.C. belt driven so that engine may easily be utilized for other purposes. Powered by a rope start, 8 HP engine wt. 230 lbs. Regular list \$385.00. Factory price.....\$299.50  
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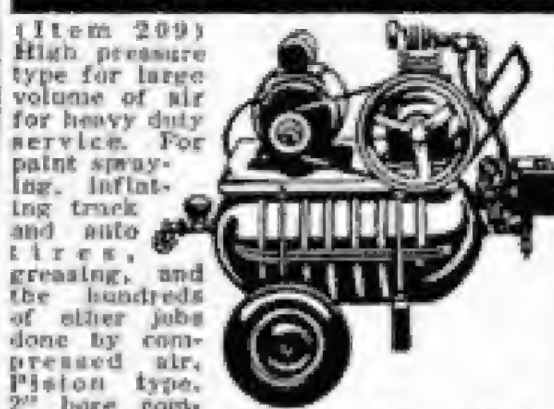
**3000-3500 WATT PLANT (Item 198)** 110-220 v. 60 cyc. A.C. Belt drive with Wis. Engine. Push button start. Wt. 370 lbs. Heavy duty.....\$399.50  
Generator only for belt drive, Wt. 115 lbs. (Item 198A) \$239.50  
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**HI-LINE 6000 WATT PLANT**  
Push Button Start, 115-230 v. 60 cycle A.C. A brute of a power plant with a rugged 18 hp. Wisconsin engine. Plenty of electricity for ranges, water heaters, freezers, pumps, machinery, etc. Affords both 110 and 220 volts. Ideal where heavy current is needed. Wt. 590 lbs. Easily worth \$995.00. With self starter, Factory price.....\$645.00  
Same plant but with Crank Start. (Item 163).....\$585.00  
Generator and control box only, belt driven. Use your own engine or tractor. Wt. 240 lbs. (Item 163) Factory price.....\$345.00  
We make fully automatic controls to operate any of above light plants. Write for details.

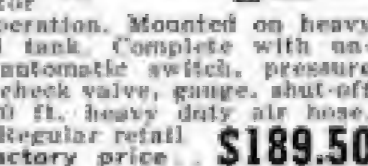
## MASTER AIR COMPRESSOR



(Item 209) High pressure type for large volume of air for heavy duty service. For paint spraying, inflating truck and auto tires, greasing, and the hundreds of other jobs done by compressed air. Piston type. 2" bore compressor with built-in air filter. Master built with hi-strength alloys and precision bearings. Stainless steel tank, 12"x24", 2100 cu. in. cap. Safe up to 500 lbs. Equipped with automatic switch that starts and stops motor to maintain desired pressure (up to 150 lbs.) and check valve, safety valve, gauge, shut-off valve, 20 ft. air hose and tire chuck. Beautifully balanced on ball bearing wheels and rubber tires. Low factory prices. With 1/2 hp. 115 v. A.C. motor (Reg. \$175.00) (Item 209).....\$98.50  
With 3/4 hp. motor, Reg. \$195.50, (Item 209A).....\$119.50  
With 2 hp. Briggs Gas Engine, (Item 209B).....\$109.50  
Write for prices of compressors only. A complete line of spray guns and air tanks available.

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## HEAVY DUTY D-C ARC WELDER

Use as portable or shop welder. Up to 300 amps. Senior model. Made for years of trouble-free, continuous service. Will handle light or heavy jobs. Easily welds up to 3/4" plate using 1/4" rods. Built-in air cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hi-to switch and dial control gives wide range of welding heats. Run welder at 2000 rpm. with tractor, jeep or 15 hp. gas engine, or 7 hp. elec. motor. Complete with instructions, gear, and double V belt or flat pulley. You can pay more, but you can't buy a better welder. (Item 38) Wt. 110 lbs. \$400 value at.....\$99.75  
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**WELDING KIT.** Two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at.....\$10.50  
Write for prices on A.C. Arc Welders.

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## EXTENSION CORD



Heavy duty made of Buna Insulated #14, 2 conductor stranded wire enclosed in a braided jacket moderately flexible and ideal where frequent coiling is not required. Resists oil, grease or water. Use indoors or out. Complete with heavy rubber plug and outlet. (Item 16) 40 ft. 2 1/2 lbs. \$1.99  
Comb. 2-40 ft. and 1-20 ft. total 100 ft. length (1 piece).....\$4.95  
100 ft. length (1 piece).....\$4.85

## NEOPRENE EXTENSION CORD

#16, 2 conductor stranded wire, extremely flexible, ideal for hedge trimmers, lawn mowers, power tools, etc. Tough and rugged, withstands any abuse. Complete with rubber plug and outlet. 40 ft. (Item 16a) wt. 2 1/2 lbs. reg. \$4.95, SPECIAL.....\$2.49  
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Wire only, No fittings.....\$5.00

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Heavy duty, very flexible. 20 year quality. Wt. 9 lbs. 100 ft. ....\$8.95  
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## 32 Pc. SOCKET SET



Highest quality guar. non-breakable sockets made by Husky. Beautiful, matched chrome alloy, absolutely the best. Complete range of 21 sockets from 3/4" thru 7/16" in 1/4" drive and 7/16" thru 1-1/16" in 1/2" drive; 2 extensions, reversible 1/2" ratchet, adaptor bit, slide head, all angle coupling, 2 end wrenches, 1/2" speeder handle and sturdy metal tool box. For prof. mechanics who want the best. Wt. 14 lbs. (Item 59) Easily worth \$41.50.....\$16.95

## 37 Pc. SOCKET SET

Consists of above described set, but includes a big dachshund tool box with ample room for other tools plus a 5 pc. hi-chrome alloy combination wrench set. Easily worth \$49.50. (Item 59b).....\$19.95

## 45 Pc. SOCKET SET

(Item 205) Contains a complete set of sockets in 1/2" drive, 3/4" drive and 1/4" drive, plus all necessary extensions, handles, speeders, reversible ratchets, etc.; all unbreakable, guaranteed against breakage. Beautiful matched chromed thin wall alloy sockets in a sturdy handsome steel tool box. Wt. 17 lbs. List price \$62.00. Factory Special.....\$26.95

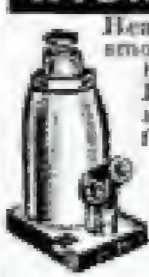
## VENTILATING FAN

(Item 10) Mount in wall or ceiling to ventilate any area. Over range, removes kitchen smoke and odors. Easily installed in furnace pipes. Forces even heat to all rooms. Powerful continuous duty motor, 110-120 v. A.C. Quiet, super efficient fan moves huge volume of air (400 to 600 c.f.m.) 8" Fan, wt. 5 lbs., \$6.85; 9" Fan, wt. 6 lbs., \$7.85; 10" Fan, wt. 7 lbs., \$8.85; 12" Fan, wt. 8 lbs., \$9.85.  
**HEAVY DUTY FAN.** Semi-enclosed motor, suitable for spray booths, restaurant exhausts, poultry houses, etc. 10" Fan, wt. 8 lbs. Item 10E \$11.95. 12" Fan, wt. 10 lbs. Item 10D.....\$12.95



## HYDRAULIC JACKS

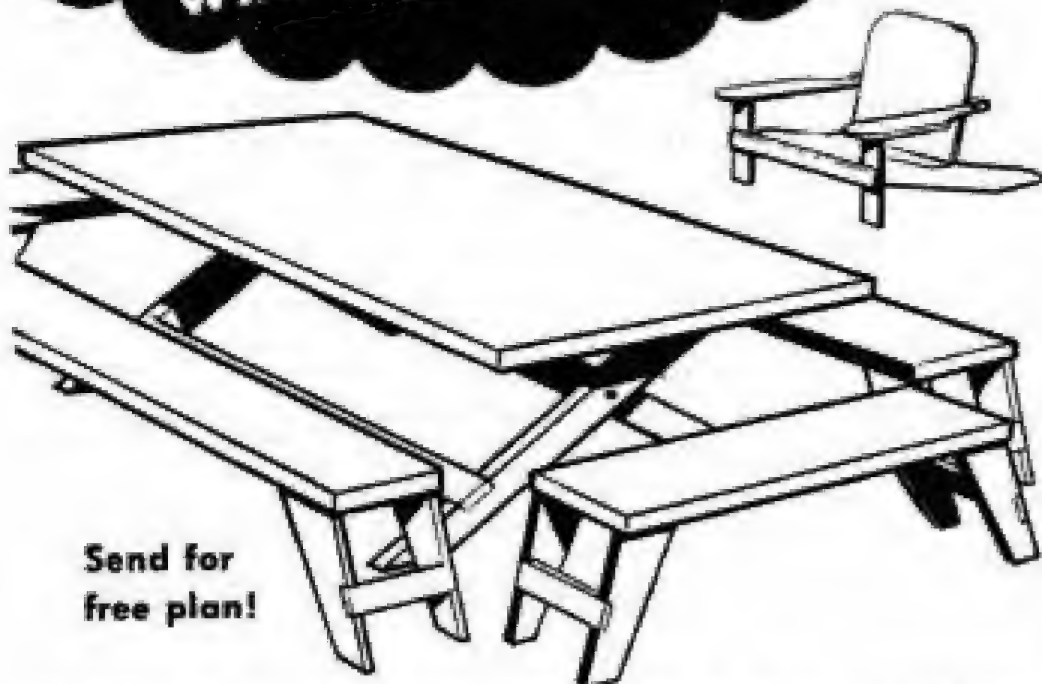
Heavy duty, precision built, smooth, positive acting with built-in relief valve. Hi-Lift with screw extensions. Govt. surplus at a fraction of orig. cost. (Handle included.) 3 ton (Item 208A) Wt. 15 lbs. ....\$9.45  
5 ton (Item 208B) Wt. 17 lbs. ....\$11.45



Prices f.o.b. Factory. 10 day Money back guarantee. Send check or Money Order  
**MASTER MECHANIC MFG. CO., DEPT. 60-C Burlington, Wis.**



*You can make  
this picnic table and chair  
with MASONITE PRESWOOD*



Send for  
free plan!

Have more fun outdoors this summer! Enjoy picnic lunches, play cards, etc., on this sturdy table with smooth, durable Masonite Tempered Presdwood® on top and seats. And for sun-soaking, the roomy lawn chair is ideal.

These tough, grainless, all-wood hardboard panels take plenty of knockabout punishment. Weather extremes won't bother them. Never splinter, splinter, or crack. Won't snag clothing and they withstand rain and snow. Easy to cut and fit with ordinary hand tools.

Masonite Presdwood can do scores of jobs around the house, quickly and at low cost. Send for complete information and free home craft plans.

See your local building materials dealer for  
**MASONITE PRESWOOD PRODUCTS**

**A type and thickness for every job!**

- **Standard Presdwood**—  
1/8", 3/16", 1/4" and 5/16" thick.
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black or brown, 1/8", 3/16", 1/4"  
and 5/16" thick.
- **Tempertile®**—1/8"
- **Duolux**—both sides smooth!  
Tempered, 4-ft. and 5-ft.  
widths, 1/8", 3/16" and 1/4" thick.
- **Leatherwood**—1/8"
- **Panelwood**—3/16" and  
1/4" thick.

**Better Hardboards for Better Home Projects**

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"Masonite" signifies that Masonite Corporation  
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- ☐ Picnic table and chairs  
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Name.....

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City.....Zone.....

County.....State.....

an area of low radioactivity. Under that low there should be oil if the new theory is correct.

What makes this radioactive halo around an oil deposit? And why is there low radioactivity in the center? No one knows for sure. One theory, held by Lundberg, Scherb, Reiss and others, is that oil vapors, which are known to rise in a halo pattern from deep oil pools, may carry with them concentrations of radioactivity that they have absorbed on the way up.

There's still plenty to find out. "For instance," says Scherb, "how do you account for surveys where the radioactivity over the center of an oil field was greater than that around the edges? Thousands of surveys must be made before we'll know how to interpret the readings we get. Perhaps they'll reveal not only oil, but types of traps when we know how to read them."

No one is ready to say that the method is foolproof or that it can be used alone. "A good scientist will use all the tools and data available to him before plunging," says Scherb. "If a radioactivity survey shows a low over an area that magnetometer and seismic work indicates to be a possible oil trap, the chance of hitting oil there is just that much better. Even if atomic oil prospecting only better the batting average of the explorers, it will be worth-while."

Several big oil companies think so, too. Their planes have been flying atomic instruments over oil fields everywhere for the past several months. Some results have been startling. Several outfits have cautiously reported the familiar halo pattern on several test runs. No one is talking, but this much is certain: Three wells, drilled in the center of a radioactive ring that showed up on a scintillometer survey in Creek County, Okla., have come in strong. The only other well in that field—drilled before the survey was made—shows up on the map beyond the low radioactive center of the pool. It was a dry hole!

All the wells in the center of a radioactive halo that bloomed from an atomic survey of Naval Reserve Pool in Osage County, Okla., are the big producers. Those that sit on the fringes beyond the radioactive rim are poor or dry.

Can you get a scintillometer and go scouting in the back yard for a bonanza? The answer is yes—if you've got the \$495 that the little Buck Rogers pistol-grip outfit costs. A good radioactivity survey of a possible oil field, backed up by proper seismic and magnetometer work, can save money for an experienced oil prospector, all right. "But it takes people who know what they're doing," Scherb says. ★ ★ ★



HOME HOBBYISTS! MECHANICS! CARPENTERS! FARMERS! THE POWER SAW YOU'VE ALWAYS WANTED!

# Sensational Summer Special!

NATIONALLY FAMOUS



QUALITY ALL METAL

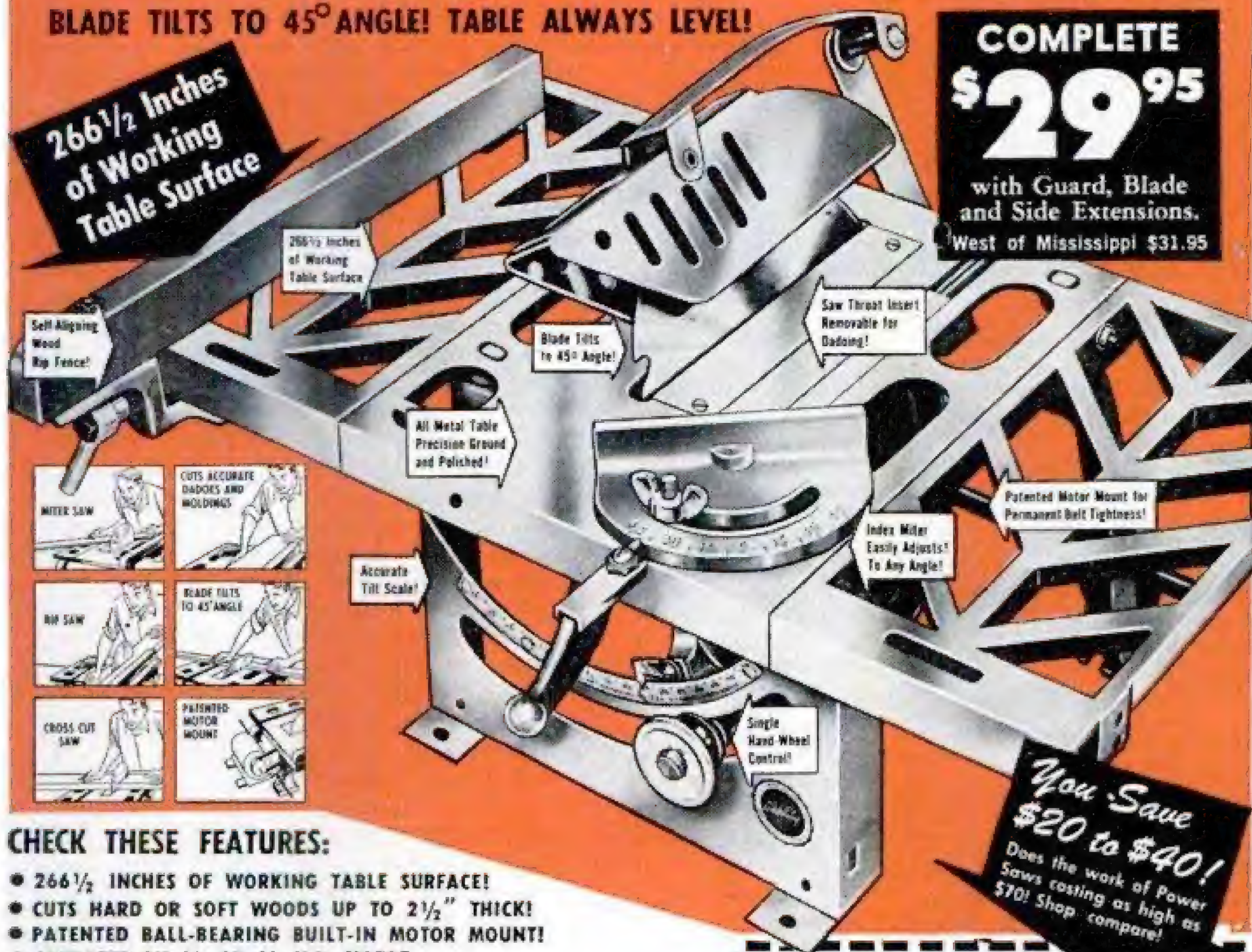
## 8-inch TILT ARBOR SAW

BLADE TILTS TO 45° ANGLE! TABLE ALWAYS LEVEL!

266½ Inches  
of Working  
Table Surface

COMPLETE  
\$29<sup>95</sup>

with Guard, Blade  
and Side Extensions.  
West of Mississippi \$31.95



### CHECK THESE FEATURES:

- 266½ INCHES OF WORKING TABLE SURFACE!
- CUTS HARD OR SOFT WOODS UP TO 2½" THICK!
- PATENTED BALL-BEARING BUILT-IN MOTOR MOUNT!
- OPERATES ON ¼ OR ⅓ H.P. MOTOR

A bargain if there ever was one! This big new 8-inch Tilt Arbor Saw *does everything* — yet costs \$20 to \$40 less! It cuts 2x6's in 2½ seconds! Cuts hard or soft woods up to 2½ inches thick. Cuts joists, sidings, rafters, frames, joints, slots, etc. Accurately rips wide or narrow panels, and cuts at a compound angle. Has height lock for dadoing. It features

the only improvement in tilt arbor saws in 75 years — a patented method of planar-centric cradle suspension. One simple adjustment tilts the blade up to 45°. Mounts on any kind of tool bench.

**Money back guaranteed** if this 8" Tilt Arbor Saw does not please you in every way. Mail the coupon at once while this offer lasts.

*You Save  
\$20 to \$40!*  
Does the work of Power  
Saws costing as high as  
\$70! Shop compare!

YOLANDS PRECISION TOOL CO., Dept. PM 101  
20 Boylston Street, Boston 16, Mass.

Please rush your new ALL-METAL 8-INCH TILT ARBOR POWER SAW complete with Guard, Blade and Side Extensions. I enclose ☐ Check, ☐ Money Order for \$29.95 plus \$1 shipping charge. West of the Mississippi the price is \$31.95 plus \$1 shipping charge.

Name.....

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# MODERN INSULATION

## MAGIC

YOU'LL BE  
AMAZED  
WITH

## REYNOLDS ALUMINUM REFLECTIVE INSULATION

Take it home



500 sq. ft. under his arms

Put it up



Easy to tack or staple

Work a "miracle" in your walls or attic with this aluminum foil bonded to tough kraft paper. Costs only about \$40 to put up over ceiling of average 6-room house. Reflects up to 95% of radiant heat. Summer heat bounces off; interiors often 15° cooler. Winter heat reflects back inside. Clean, odorless, pliable. Tack or staple over ceilings or under rafters, between wall studs, under ground floors. Perfect vapor barrier. Fire-retardant. Two types. foil on both sides for double air space; one side, to face single air space. Rolls 250

### Aluminum Sheet for Rust-proof Flashing, Termite Shielding, General Shop Work!

New all-purpose carton of ten 18" x 48" sheets, .019" thickness. Best for flashing, also great idea for over sink or stove, door kicks, etc., etc.



sq. ft., 25", 33", 36" wide. Also makes wonderful reflectors for radiators, photo lights, etc. Mail coupon for *free samples*.

**Aluminum gutters**—cost much less than other rust-proof materials. Non-staining. Put them up yourself—slip joints, no soldering.

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## REYNOLDS Lifetime ALUMINUM BUILDING PRODUCTS

MAIL THIS COUPON NOW!

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Send full information and FREE SAMPLES of Reflective Insulation. Also full details about

☐ Gutters & Downspouts; ☐ Nails; ☐ Flashing  
Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

## What's Happening in TV Around the World

(Continued from page 98)

failed to stimulate more than a few hundred people to buy television sets (at \$560 each) and pay license fees.

The Netherlands, with 7000 receivers, has a station operating near Amsterdam.

Belgrade, Yugoslavia, is said to have an operating TV station, and two more stations are planned.

All other stations in Western Europe are either experimental or proposed. The Saar has an experimental station. So do Oslo, Madrid and Stockholm. Two more are proposed in Sweden (which now has only about 100 receivers), three more in Spain.

Istanbul has an experimental station, and one is under construction at Casablanca, French Morocco.

But what's happening behind the Iron Curtain? Russia, with limited equipment, is getting into the act. The first programs from the Reds' East Berlin station were telecast Dec. 21, 1952. According to recent report, the studio has only one television camera and broadcasts only from 8 to 10 p.m. The only receiving set on the East German market costs a year's income for an average workman. As a result, practically all are in public places and meeting halls. Like the Prague station scheduled to begin operation this year and an experimental Warsaw station operating intermittently, entertainment consists chiefly of propaganda films.

Russia itself has a station in Moscow, where 60,000 sets are reported; one at Leningrad, with 15,000 receivers; and one at Kiev, with 2000 sets. The Russian stations operate on a 625-line standard, like most of Europe. Most receivers have a nine-inch picture tube, although new 12-inch receivers are appearing. Color sets for experimental programs may be available this summer.

Japan's government-owned television system envisions a 30-station hookup blanketing the islands within five years. Soon, seven relay stations will link Tokyo transmitters with sets 300 miles away. One Tokyo station began telecasts in February, featuring sports coverage, Voice of America films, newsreels, variety shows, lectures, cooking courses, dramas and puppets.

American-installed and using the American 525-line standard, the Japanese stations are presently being picked up by only a few thousand receivers, most of them American. But Japanese manufacturers will soon start turning out low-cost receivers aimed for a potential mass market.

(Continued to page 256)



# 10 times more powerful than all other present day TV antennas!

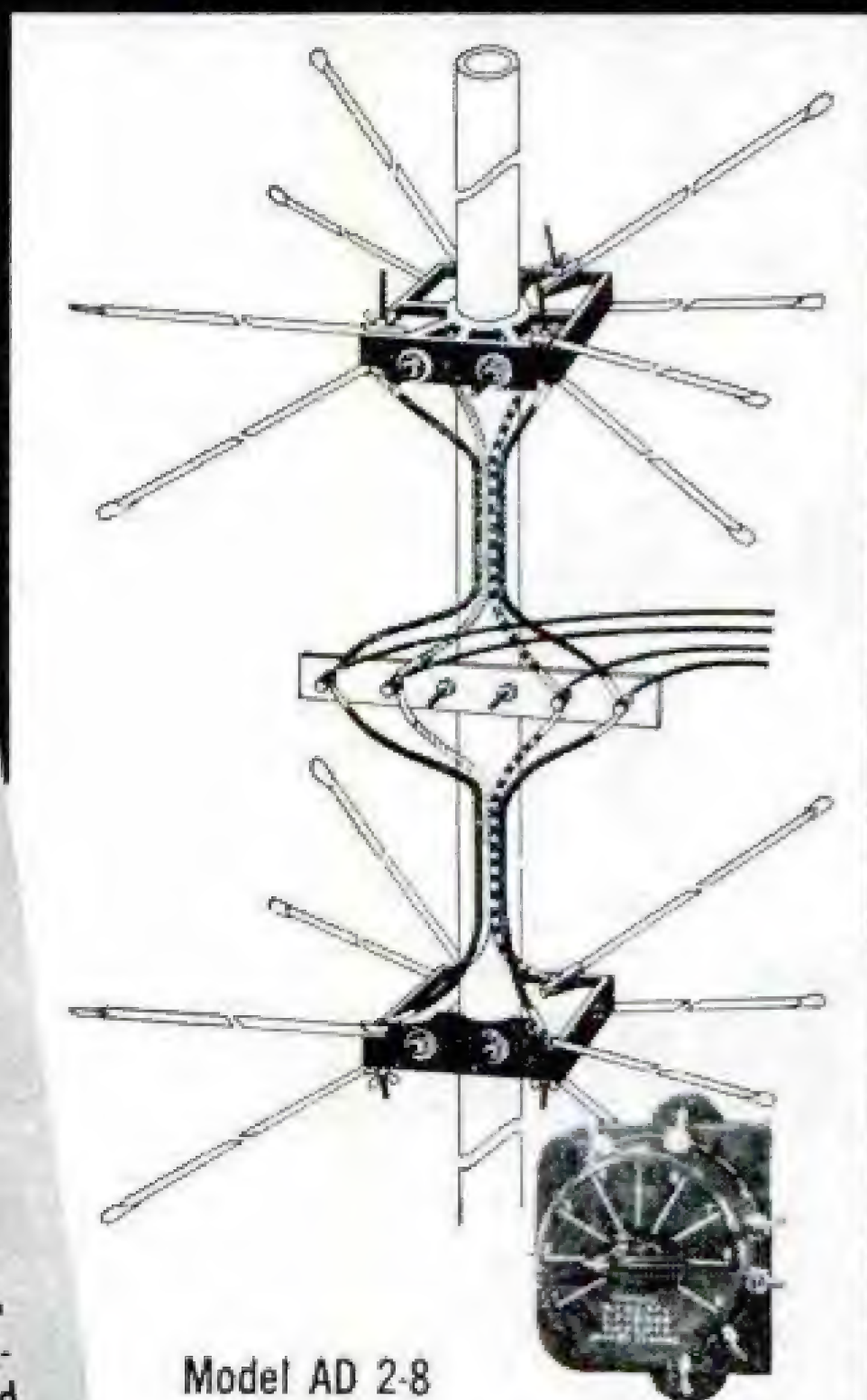
- Guaranteed 10 times more powerful than stacked 10 element Yagis.
- Receives channels 2 thru 83 from all directions without a rotomotor.
- Broadband UHF-VHF and FM, motorless; all direction reception.
- Pat. #2,585,670-2,609,503-2,625,655 others pending.
- All aluminum flip-out assembly.
- Simple, easy to install.

The only TV antenna that instantly beams the television set directly to the signal without a rotor. This simple, easy to install antenna brings strong UHF & VHF signals from all directions to weak signal areas instantly... with a flick of the nine position switch located near the television set.

## MONEY BACK GUARANTEE

Model AD 2-8 antenna is unconditionally guaranteed to outperform and unquestionably bring in clearer, stronger and sharper pictures than any and all other television antennas on UHF, VHF and FM.

For any reason if it fails to do this, we agree to refund to the jobber to whom we sold and shipped it, his full purchase price.



Model AD 2-8

Includes Stacked Antenna Array, 9 position switch. Completely wired stacking harness, AIM — Automatic Impedance Matching coupler.

**\$36<sup>50</sup>**

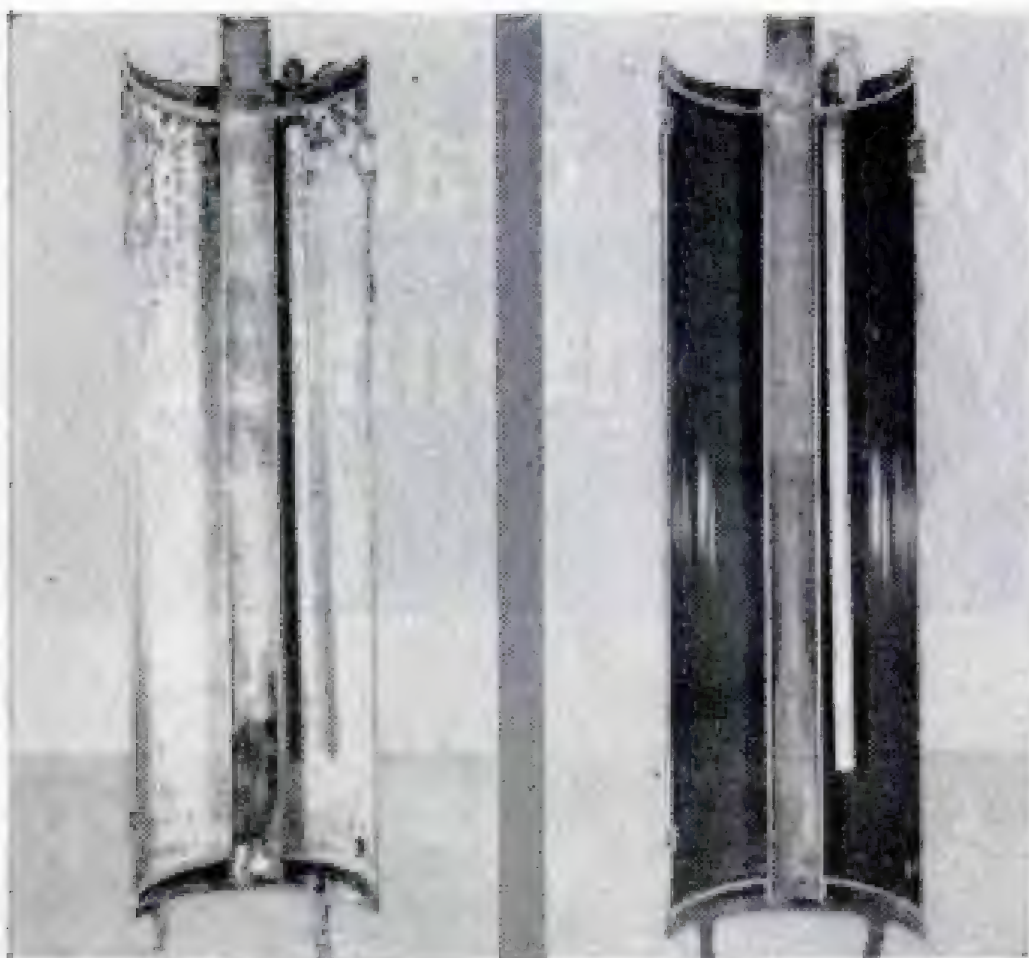
LIST PRICE

**ALL CHANNEL ANTENNA CORP.**

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SEE YOUR LOCAL DEALER,  
OR WRITE FOR THE NAME  
OF NEAREST JOBBER.





**ORDINARY WATER HEATER INTERIOR**

Unretouched photo shows how rust eats away unprotected metal in just one year of use. Note deep rust pits!

**PERMAGLAS WATER HEATER INTERIOR**

Unretouched photo shows that Permaglas glass-surfaced steel tank does not rust ... because glass can't rust.

# Be Safe from

# RUST

With an A. O. Smith

# Permaglas®

Automatic Water Heater

If you could see the insides of an ordinary water heater, you'd shudder to think of using water heated in so rusty a tank.

To be safe from rust, buy an A. O. Smith Permaglas water heater. Enjoy all the clean, hot water you need for health protection and cleanliness. Permaglas costs no more than ordinary water heaters. Its glass-surfaced steel tank can't rust because glass can't rust!

Write for "Murder . . ." booklet of pictured facts.—A. O. Smith Corp., Dept. PM-653, Kankakee, Illinois. International Division: Milwaukee 1. In Canada: John Inglis Co., Ltd.



A. O. Smith also manufactures Gas Conversion Burners, Home-heating Boilers, Warm Air Furnaces and Commercial Water Heaters.

# A.O. Smith

PERMAGLAS-HEATING PRODUCTS

A privately owned station is planned for Bangkok, Thailand. Due in April was Manila's first station, owned by Juan Quirino, brother of the Philippines president.

In Australia, the fight between commercial and state TV has stalled operations.

The only other TV stations operating in the Pacific area are in Hawaii, where regular programs began last December on two stations in Honolulu.

Far more active than any country in Asia or continental Europe, however, is little Cuba, where a five-station network covers the entire island, and the most remote hamlet can enjoy regular TV. There, where TV sets are in demand and tariffs exceptionally high, smugglers last year engaged in a roaring video trade. Fast cutters loaded up at Miami or Key West with American TV receivers and swiftly transported them to isolated coves along the Cuban coast. A few months ago, planes flying around the clock dumped as many as 600 sets a day in Cuba, where smuggled receivers are estimated to number one fourth of the island's total of 125,000 sets.

The Dominican Republic boasts a television station, located in Ciudad Trujillo and completed last August.

Brazil, with three television stations, two of them in the Sao Paulo area and one in Rio de Janeiro, has big plans—six more stations are under construction and 45,000 sets are in use. Brazil, according to Edmund A. LaPorte, RCA Chief Engineer, may be the first country outside the United States to use UHF channels.

Venezuela has two stations in operation. Another will open by the end of the year.

President Peron of Argentina recently opened a powerful million-dollar station in Buenos Aires. Uruguay has postponed work on its TV station. Guatemala is expecting developments in Guatemala City in the near future.

Mexico, which is just finishing a \$3,000,000 "television city" and a 500-foot transmitting tower in the capital, already has five stations and has issued construction permits for 27 more. At least 35,000 sets are in use. The new studios in Mexico City would make any television producer happy: One of the four large studios is big enough for a circus or a basketball game, and the potential audience of one Mexico City station is 3,000,000. Possibly a relay will be established on the side of near-by Popocatepetl to transmit TV to large population centers within range.

Possibly microwave relay will connect Mexico City, Monterey and San Antonio, so that Mexicans can get American network programs and Americans can receive

(Continued to page 258)



# GOOD TIP for FATHER'S DAY!

(June 21)

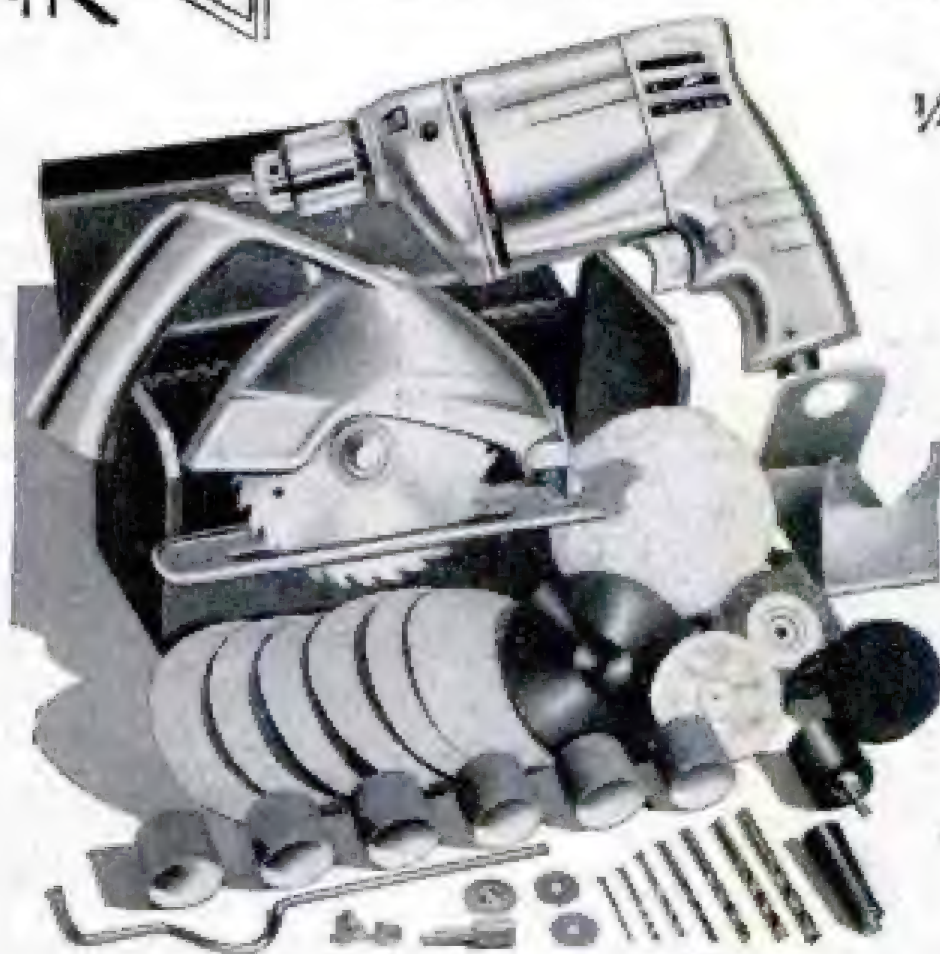


Parade the family past a PET Power Tool display. Complain a little about your old hand drill and saw. Because you *know* they'll buy a gift. And it'll be so much better if you're *both* pleased!

Why PET Tools? Because they give you *plus power per pound*! They're *easy* to work with... extra fast on "do-it-yourself" jobs... and easy on the pocketbook too! So start hinting. And don't forget to act surprised! You'll find PET Power Tools at all leading hardware stores.

**PLUS  
POWER  
PER  
POUND**

*...and the price  
is right!*



## 1/4-inch DRILL & SAW KIT

Rugged pistol-grip drill with gear-type chuck. Special-duty design for ample power. Ball thrust bearing takes drilling load. Forced ventilation. Drill saw attaches to drill, cuts up to 1" deep, angles from 90° to 45°. All attachments to grind, sand, polish, mix paint. Durable "hip-roof" steel case.

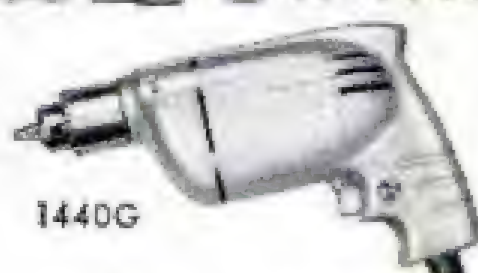
Model 1440GDK.  
Complete... **\$45.00**



## SANDER-POLISHER KIT

For furniture, the car, every waxing, polishing, sanding job. Powerful motor, trigger switch, instant release lock. Lamb's wool polisher, complete set of sanding discs, rubber backing pad and adapter, and drill chuck. Two packages of world-famous Johnson's Wax—liquid and paste.

Model 1540K ..... **\$30.00**



1440G



1490G

1/4-inch **ELECTRIC DRILL**. Same as with kit.

Choice of pistol grip (Model 1440G) **\$25.00**  
or saw grip (Model 1490G).....

Either drill but with hand-type  
chuck ..... **\$22.00**

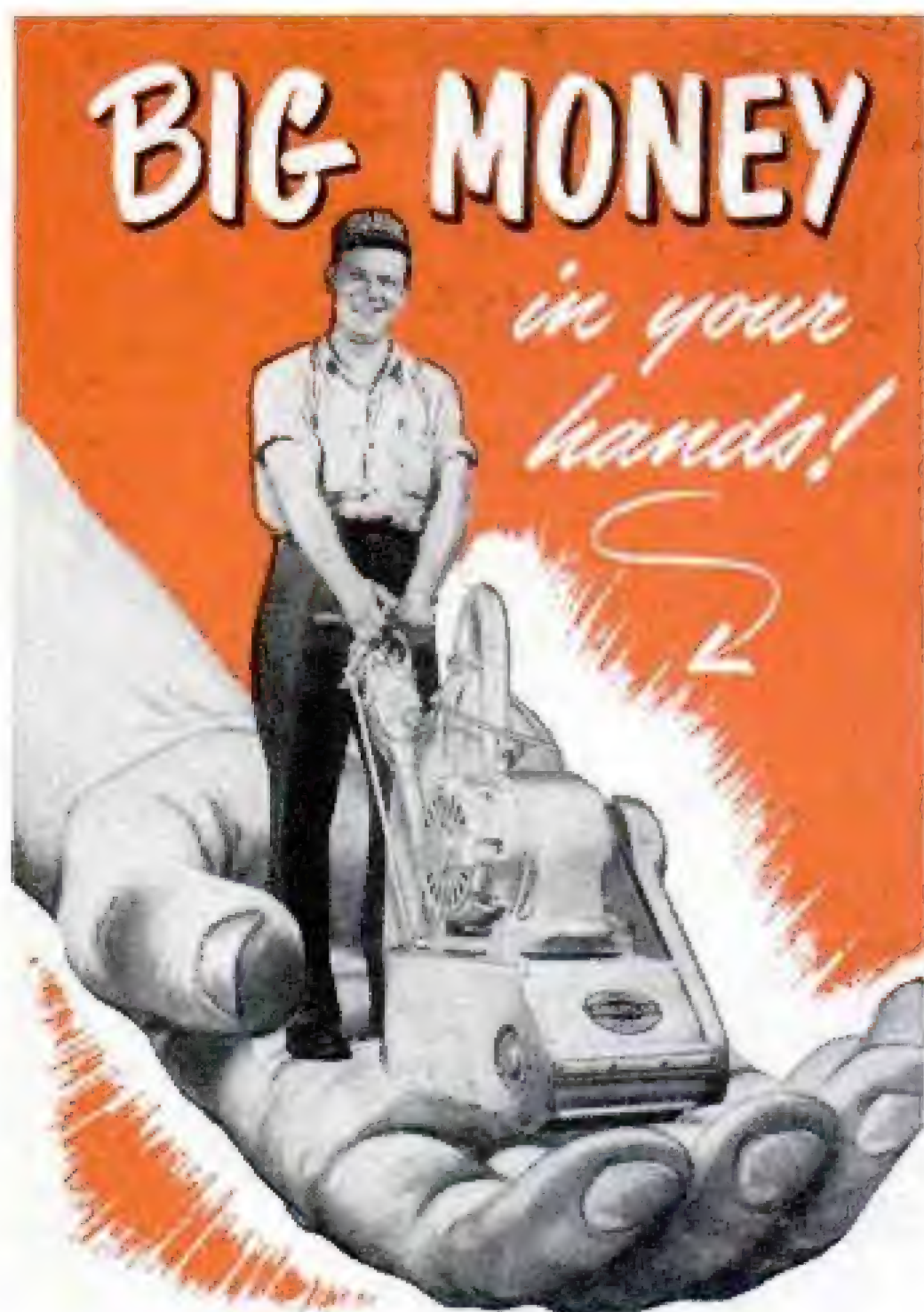


**PORTABLE ELECTRIC TOOLS, INC.**  
320 W. 83rd St., Dept. PM-63, Chicago

In Canada: Portable Electric Tools, Ltd.,  
452 Birchmount Rd., Toronto

Prices slightly higher in Canada





**BE YOUR OWN BOSS!** Men who are determined to get ahead in something for themselves will find this opportunity hard to beat! Where else can a man turn his own labor so quickly and easily into **BIG MONEY!** Earn as high as \$50 and more a day sanding floors with an easy-to-run American Machine—and **YOU ARE BOSS.** Prospects everywhere—old and new homes and remodeling. Pleasant indoor work—steady the year round. No schooling—no experience needed. Age makes no difference—men 18 to 80 are active and successful. Send coupon for "money-making" booklet entitled "Opportunities in Floor Surfacing"—enclose 25c in coin or stamps to cover handling.



**AMERICAN**  
FLOOR MACHINES

**SEND**

The American Floor Surfacing Machine Co.  
535 So. St. Clair St.  
Toledo 3, Ohio

Enclosed find 25c in stamps or coin for booklet "Opportunities in Floor Surfacing", telling me how I can start my own floor sanding business.

Name \_\_\_\_\_

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City \_\_\_\_\_ State \_\_\_\_\_

Mexican shows. Meanwhile, a television station is operating opposite Brownsville, Tex., beaming English-language programs to American audiences. The station has the commercial advantage of broadcasting to a United States audience without having to abide by FCC regulations.

On the other hand, American border stations under construction in upper New York and Vermont will beam to the Canadian market. As of now, no private Canadian stations can be built except in areas where the Canadian Broadcasting Company prefers not to build. The CBC differs from American and European television in that programs are produced by the state-owned system and then sold to advertisers. Montreal and Toronto opened TV stations last September. Ottawa may be the site of the first private TV station.

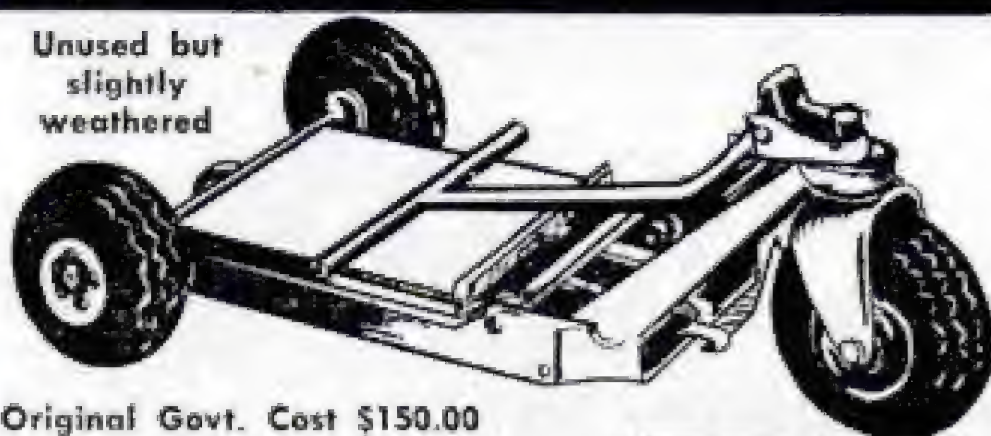
CBC stations are also planned for Vancouver, Windsor, Halifax and possibly Quebec City. A microwave-relay system to link Montreal, Ottawa, Toronto and Buffalo will be completed some time in 1953.

Canadian receivers are expensive, partly because of a sales tax which helps to pay for the government-owned CBC. Imported American receivers suffer from heavy duties. But apparently, Canadians, like millions of people all over the world, believe that television is worth its cost. ★ ★ ★

### LIMITED QUANTITY OF MULTI-PURPOSE ARMY SURPLUS **HYDRAULIC TOWING AND LIFT TRUCKS—**

Ideal for: Transmission Jacks, Warehouse Trucks, Factory & Shop Use, Boat Trailers, Mounting Welding Equipment, Farm Use, Factory Trailers, Yard Equipment for Portable Use.

Unused but  
slightly  
weathered



Original Govt. Cost \$150.00

Roller Bearing Wheels

Size Overall 59" Long, 33" Wide

Platform 17 1/2" x 23 1/2"

Tire Size 13 x 5.00

Platform Raised 13"

Platform Lowered 6 3/4"

Capacity 2000 lbs.

Length of Draw Bar 31 1/2"

Total Weight per unit 285 lbs.

Pneumatic Airplane Type Tires

\$10 Deposit required each order or will ship on open account to accredited firm.

**DON'T MISS THIS  
VALUE—ONLY**

**\$32.50**

**F.O.B. ATLANTA**  
Lots of 6 or More  
10% Discount

Sturdy and well made.  
Order yours today.  
Satisfaction guaranteed.

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EXCHANGE**

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## HYDRAULIC SPEED REDUCER

(ITEM #115) WITH FINGERTIP CONTROL

USE FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Cream Separators • Garden Tractors • Pumps



Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Use input power of 1/4 to 1 1/2 H.P. This Westinghouse-Oil Gear Unit consists of a variable displacement hydraulic pump feeding a fixed displacement hydraulic motor. Adjustable relief valves set at factory for 100 inch pounds of torque may be reset up to 180 inch pounds. Independent reverse control allows full output power and speed selection in either direction of rotation. Shafts measure 3/8" diam., include keyway. Input rotation is counter-clockwise facing shaft. Recommended input speed not to exceed 750 R.P.M. Over-all dimensions: 7 1/2" x 7 1/2" x 11 1/2". Gov't acquisition cost, \$425.00. Ship. wt. 31 lbs. Complete with 2 sets of oil and full instructions. F.O.B. Chicago.

**54.50**

SHOP by MAIL  
★ and SAVE ★  
at GROBAN'S



## TINY TIM BATTERY CHARGER

Item #301 Model 125 to charge 6 and 12 volt batteries — 12 volts — 300 Watts; Heavy Duty Generator; Push button self-starter; Sturdy single cylinder air cooled Continental 1.3 H.P. engine; 2 qt. gasoline tank in base; Ammeter; Generator cut-out; Concealed coil, etc.; Speed and charging rate control; Attractive orange finish; Weight 93 lbs.; Length 15 1/2", width 11 3/4", Height 14 3/4". F.O.B. Chicago..

**89.00**

## CENTRIFUGAL PUMP

General Motors — Allison  
200 GALLONS PER MINUTE

For Draining Basements  
Fire Fighting • Irrigation  
Fuel Transfer  
Swimming Pools  
Home Water Systems  
Dewatering



(ITEM #130)

For high volume commercial, home and industrial use. Standard 2 1/2" pipe thread inlet, twin 1 1/2" pipe thread outlets. Ball bearing supported 3/4" shaft. Easy priming. Rotation, counter-clockwise facing shaft. Gov't. acq. cost \$145.00. Complete with full instructions. Ship. wt. 35 lbs. F.O.B. Chicago....

**39.50**

Suction Lift	Head Pressure	Gal. Per Min.	H.P.	R.P.M.
10'	75'	260	6.0	3500
10'	65'	200	5.2	3500
10'	50'	140	4.0	3500
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FREE 1953 CATALOG 48 pages, chuck-full of unsurpassed War Surplus Equipment Bargains for farm, home, factory and workshop. Every item is unconditionally guaranteed. You save on everything! Write today.



(ITEM #126)

Item #126 — Four-way, open center control valve with built in adjustable relief valve. Factory set at 1000 P.S.I., spring loaded neutral position, for use with one double acting cylinder. In neutral position cylinder is locked and pump unloaded. Fully balanced plunger type, smooth, positive, easy operation. Can be used as single unit or mounted in series of any combinations desired. Has 3/4" pipe thread inlet and outlet. 1/2" pipe thread cylinder ports. Newly manufactured to our specifications. Shipping weight 8 1/4 lbs. An outstanding buy! F.O.B. Chicago...

**21.50**

Item #1000—Double action Hydraulic Cylinder, 3" bore, 10 3/4" stroke, 1 1/4" chrome plated steel shaft, 3/8" standard pipe thread ports. Maximum lift capacity, 7100 lb. with 1000 PSI line pressure. Clevis mounting at both ends. Overall length closed 20 1/4". Shipping weight 18 lbs. F.O.B. Chicago.

**27.50**

## EXTRA HEAVY DUTY DOUBLE ACTION HYDRAULIC CYLINDER

Item #224. 3 1/4" bore, 24" stroke, will lift 8250 lbs. with 1000 P.S.I. line pressure. 1/2" pipe thread ports—1 3/8" stressproof ground, polished & plated—solid steel shaft. Overall length closed 38". 1 1/4" steel wall cylinder barrel, clevis mounting at base and shaft. Features—Tie Rod construction. Honed barrel. Ship wt. 50 lbs. F.O.B. Chicago.

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### Self-sealing Hydraulic Hose Coupler

Ideal for use where hydraulic systems are frequently disconnected or changed, as on towed farm implements. Each half has 1/2" female pipe thread at ends. Length—3 3/4". Width—1 1/2". Shipping Weight 1 1/2 lbs. Price, F.O.B. Chicago.

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### High Pressure Hydraulic Hose

6000 PSI burst pressure tested. Equipped with standard Male pipe thread fittings at both ends. 6' length with 1/4" MPT.....3.95 Ea. F.O.B. Chicago 8' length with 3/8" MPT.....4.95 Ea. F.O.B. Chicago 6' length with 1/2" MPT.....5.95 Ea. F.O.B. Chicago

**4.95**

## GENERATORS Many Sizes From 350 Watts to 25 KVA



ITEM #183

Item #183 — 3000 to 4000 WATT GENERATOR SET — FEATURES — Power for your home or business. Simply connect to power panel or house circuit. • Constant voltage regardless of load. • Push button start or stop. • Easily made full automatic start or stop. SPECIFICATIONS—Size 19"x30"x48". Steel skids, weatherproof housing, requires no building. Wt. 725 lbs. • Hercules 4-cyl. 10 HP gasoline engine. Load governor. Oil filter. Quiet muffler. 6-volt starter generator. • Hobart 115 volt, 60 cycle, 3000 to 4000-watt generator. Furnishes either single or three-phase power, 2 or 3 wire. • Panel contains oil gauge, voltmeter, ammeter, circuit breaker, voltage regulator, start button. Today's cost over \$1200.00. SALE PRICE, F.O.B. Chicago.

**465.00**

Item #300—Model C1B—3 KW—110 Volts D.C. This mighty mite develops 3 KW—28.5 amps. D.C. Standard Delco generator direct coupled to a Model ZEP Briggs and Stratton 1 cylinder, 5-7 HP, air cooled, rope starting gas engine. Instruments include voltage control rheostat & voltmeter. Ideal for Power Tools. Wt. 275 lbs. F.O.B. Chicago.

**295.00**

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Large supply of new labor-saving, economical hydraulic equipment in many types and sizes. Use these positive, highly efficient smooth pressure hydraulics on presses, arbors, lifts, loaders, power control, positioning, brakes, plastic dies, auto frame alignment, etc.

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Item #1036—Double acting hydraulic cylinder, 3" bore, 36" stroke, 1/2" pipe thread ports. 1 1/4" solid steel shaft. Overall length closed 49". Clevis mounting at base and shaft. FEATURES • Cup & Chevron Packing • All Welded Construction • Precision Ground and Honed Construction • Will lift 7000 lbs. using 1000 P.S.I. line pressure. Weight (net) 57 1/2 lbs. F.O.B. Chicago.

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HEAVY DUTY RANGE TO 250 AMPS.  
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## GET THE SQUEAKS THE GREASE MAN MISSES

My next door neighbor is a real automobile doodler—he loves to fool around with his car—take things apart and put 'em together again.

And brother, let me tell you, last week I could tell when he started to work on it. When he raised the hood there was a squeak like the wail of a tortured banshee. I went over to him and said, "Joe—for crying out loud, why don't you put something on those hood fasteners to stop that gosh-awful squeak?"

"I've tried," he says, "Nothing works. Got any suggestions Mr. Expert?" "I sure have," I says. "Try some Lubriplate on it." "Lubriplate," he says, "That's that white lubricant you told me about for my lawnmower, isn't it? Never thought about it for my car."

"It'll work," I says, "and what's more, it takes the squeak out of many other spots the grease man misses on your car such as seat tracks, speedometer cables, door hinges, switches, locks, trunk hinges, heater fans for example.

He got out his handy tube of Lubriplate, put some on the hood fasteners, worked the hood up and down a couple of times, and there she was—quiet as a mouse.

Next time you're down at your Sporting Goods, Hardware, or Auto Supply store, ask for a handy 35¢ tube. If he doesn't have it, ask him to write to LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, New Jersey.

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E2

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12" PRESS BRAKE. Fits any drill press. Open ends, forms compound bends. Freight paid. . . . \$9.50  
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1 1/8"	3/8"	3/8"	.20	1 1/2"	3/8"	3/8"	.55
1 1/4"	3/8"	3/8"	.20	1 1/2"	3/8"	3/8"	.55
1 1/2"	3/8"	3/8"	.20	2 1/4"	3/8"	3/8"	.60
1 3/4"	3/8"	3/8"	.20	2 1/4"	3/8"	3/8"	.60
1 7/8"	3/8"	3/8"	.25	2 1/4"	3/8"	3/8"	.60
2"	3/8"	3/8"	.25	2 1/4"	3/8"	3/8"	.60
2 1/8"	3/8"	3/8"	.25	2 1/4"	3/8"	1 1/4"	.60

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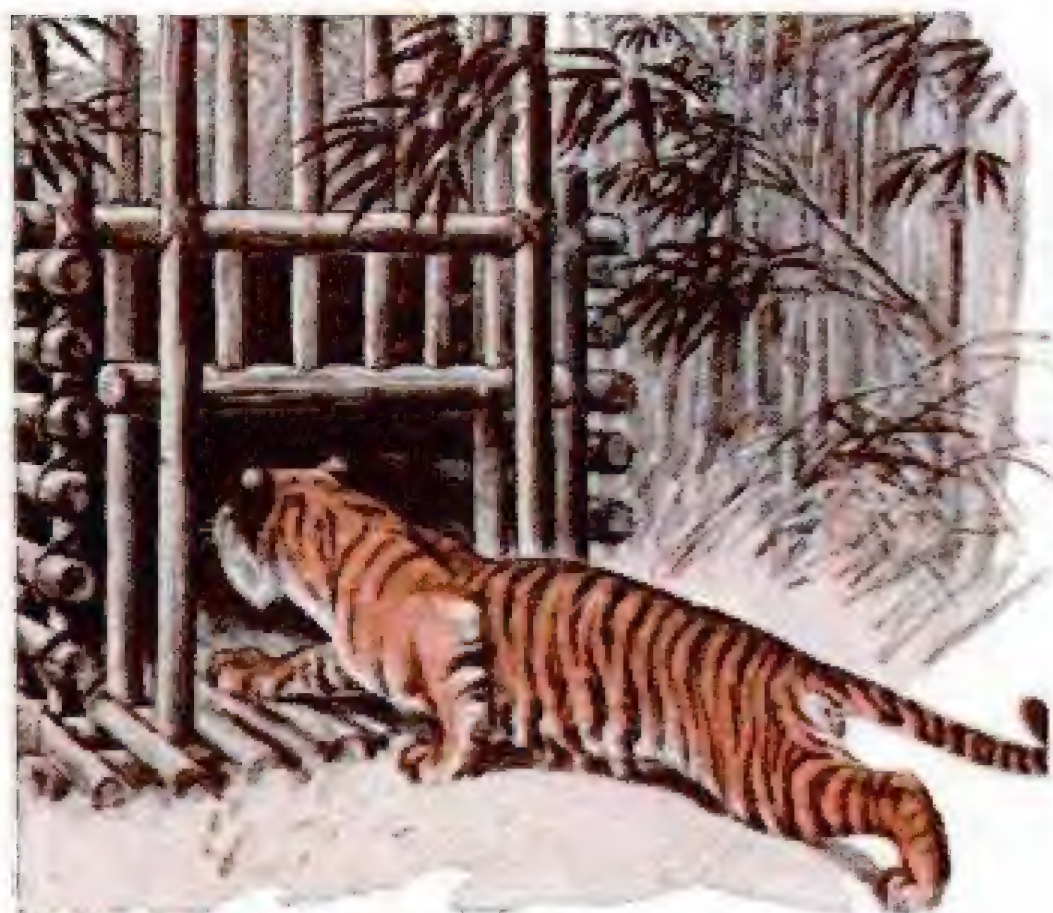
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# TRAPPED

The dangerous and wily Bengal Tiger—popular attraction in zoos and circuses—is often caught in traps like this. These traps protect the hunter without harming the tiger.

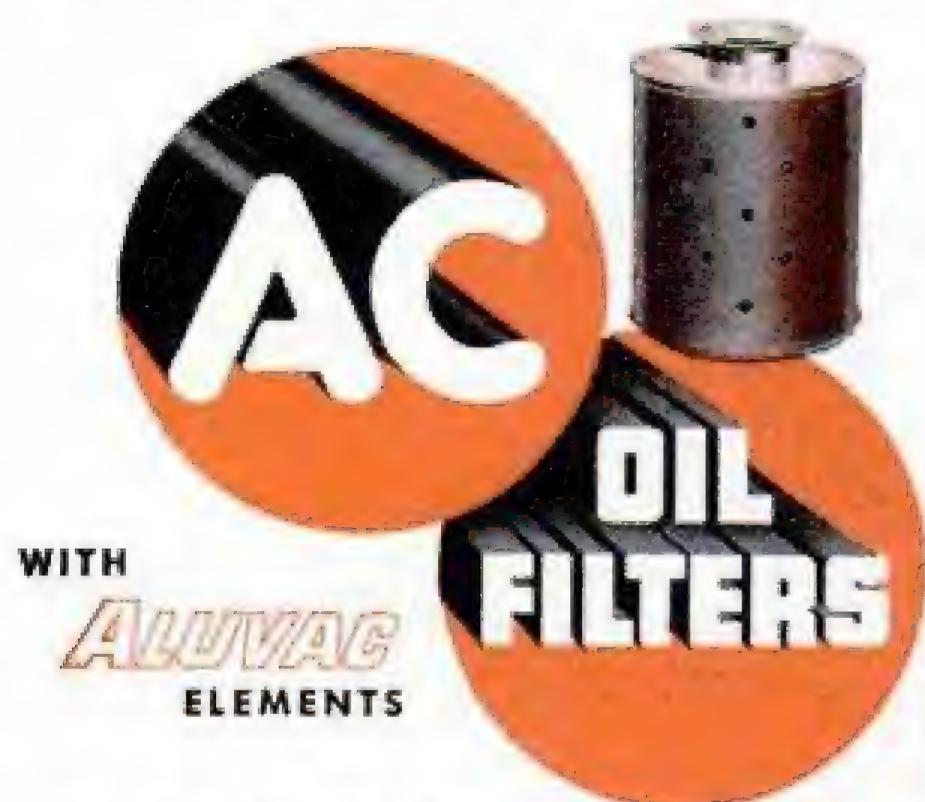


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- AC ALUVAC keeps oil clean . . . removes particles as small as 1/100,000 of an inch.
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**Money Can't Buy Better Engine Protection.**



**Protecting More New Car Engines Than Any Other Brand**



AC SPARK PLUG DIVISION

GENERAL MOTORS CORPORATION

## NBC's \$62,000 Cadillac

(Continued from page 104)

sat on their bicycle-type seats and pushed buttons that activated hydraulic pistons raising them into position through the roof. Behind them, in the soundproof trunk and spare-tire space, a three-kilowatt generator, silent and vibrationless, whirled out the watts that allowed them to televise everything in sight with complete freedom of movement.

In his turret at the rear, the cameraman's standard RCA Image Orthicon camera wheeled around the steel track that ringed him, picking up events first on one side of the moving car, then the other. Up forward, the antenna man was busy beaming the camera's signals to a receiving antenna atop the Capitol dome where they were bounced to the station's regular transmitter. He does this with a rotating horn-type parabola antenna that looks like a five-gallon paint can with a huge hook on one end. Through an eyepiece like a gunsight, the transmission man kept the massive dome of the Capitol right on the cross-hairs.

The new mobile unit becomes as flexible as a newsreel outfit when used in conjunction with the new Vidicon camera. The secret of this miniature affair is a new-type picture tube, only one inch in diameter and six inches long.

At the inauguration, the driver of the limousine studio handled the Vidicon. Whenever he saw something interesting, he would drive right up to it, lean out the window with his hand camera and, like a tourist snapping roadside shots of the scenery, start banging away.

One of the most spectacular machines that recently stuck its long boom into the TV business, is the industrial monkey, hydraulically operated double-jointed arm, swivel-mounted on the bed of a big service truck. Extended, the arm will reach out 40 feet in any direction, including up. Each of two waist-high buckets at the end of the boom accommodates one man, plus a TV camera and audio equipment. Public-utility companies, airlines, fruit pickers and other industries have been using "monkeys" to hoist men up in the air to do jobs where ladders would be impractical. No one ever thought of it for TV, until NBC's Hit Parade crew had to shoot a sequence showing skaters and crowds at the rink in Rockefeller Center Plaza last Christmas. Crews found that no matter where the camera sat, something was always in the way. Then someone thought of the monkey, and one was quickly borrowed from a local utility. A camera was mounted on the self-

(Continued to page 264)



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**ELECTRIC PLANTS**  
5,000 or 10,000 watts A.C.

YEARS AHEAD in design, performance, value! Give you regular 110-volt current for trailers, homes, farms, cabins, resorts. Air-cooled, heavy-duty engine. Costs less than any other complete electric plant.

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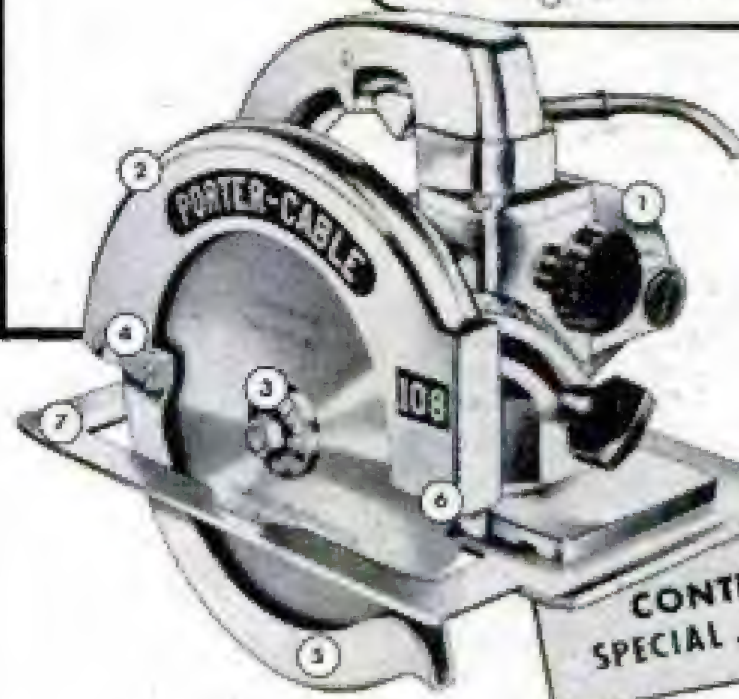
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Dept. PM17, 200 E. Ontario Chicago 11, Ill.



# New 8 1/4" saw

by **Porter-Cable**  
*Quality Electric Tools*



**CONTRACTOR'S SPECIAL... MODEL 108**

No other saw gives you so much for your money \$ **95.**

This professional Porter-Cable Saw incorporates more advanced features than any other saw - at any price!

It cuts deeper than comparable 8 1/4" saws - a full 2 3/4" at 90°. It's safer four ways. Its power whizzes it through long rip cuts - heavy cross cuts - accurate compound mitres. Cuts off 1" x 10" pine in 1 second - 12 times faster than ordinary hand saws! It's an investment that really pays off.

### More-For-Your-Money-Features:

- 1. More Power**—Bigger motor with higher amperage develops 10% more power.
- 2. Lighter**—Lightest saw of its type on the market. Weighs only 13 1/2 lbs. - takes less muscle.
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- 5. Cam-Action Guard** (patented)—Provides steady, full retraction - gets rid of extra push to overcome "hitching."
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Get all the facts on Porter-Cable's new "Contractor's Special" - see your dealer . . . or mail coupon today.

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leveling platform of the big skylift. Camera and audio men climbed in the buckets. By using eight foot-pedal switches—six for controlling movement of the boom, one for signaling the truck driver with horn beeps, another for emergency stop—they could swing themselves high over the crowd, out over the rink, dip down into the arena and, in fact, put their camera eye in just about any position desired.

The monkey was such a success that, when they planned the inauguration coverage, Colledge and William McAndrew, NBC-TV special-events chief, decided to use this machine as well as the traveling eye. It couldn't have come in handier.

"Crowds were so thick," recalls Colledge, "that unless a camera was on stilts it couldn't see anything but people's backs. We put the industrial monkey in a side street. The boom arched out over everyone, peeking around the corner like the head and neck of a dinosaur. Cameras got an unobstructed view of the marchers."

One more development that is helping to bring the world to your living-room TV screen in double-quick time is NBC's "hot developer" for kinescope film. Fastest motion-picture-developing unit ever built (according to NBC engineers), it can turn out nearly a quarter mile of negative film in an hour. ★ ★ ★

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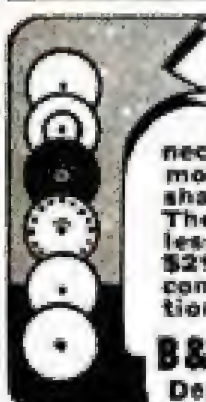
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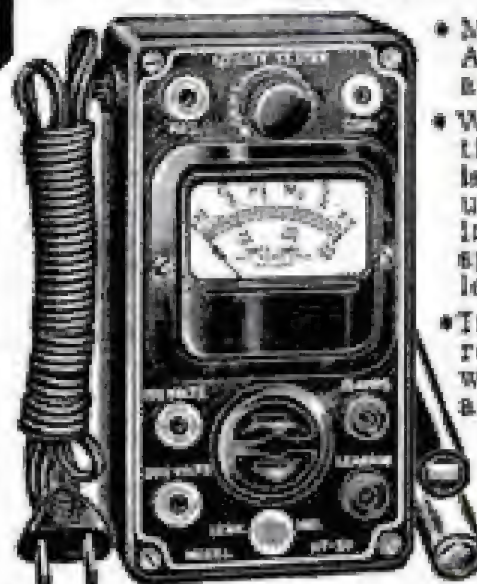


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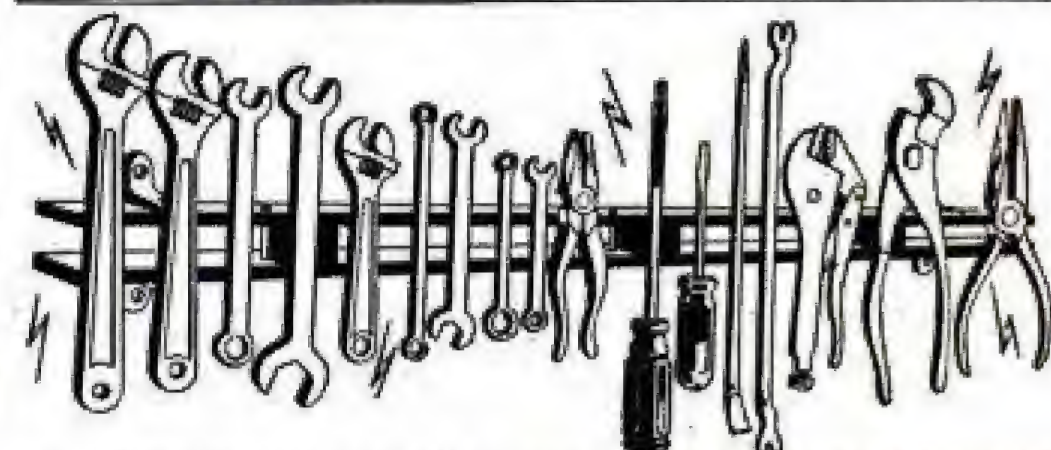


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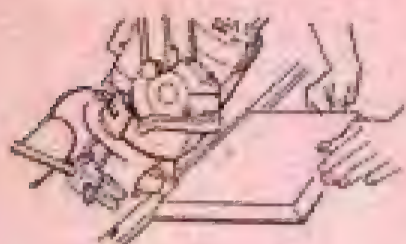
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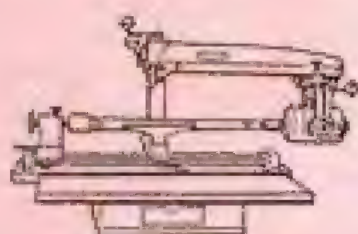
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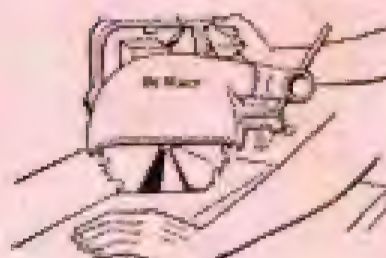
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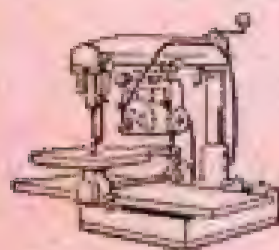
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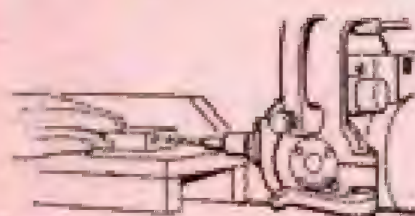
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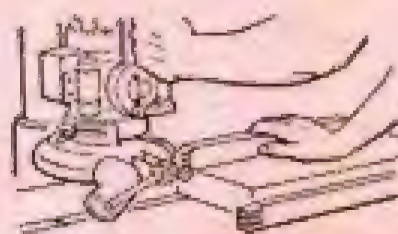
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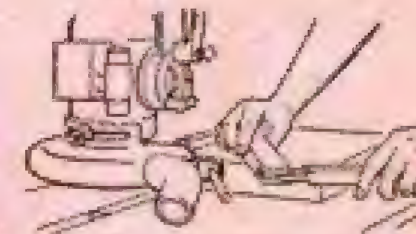
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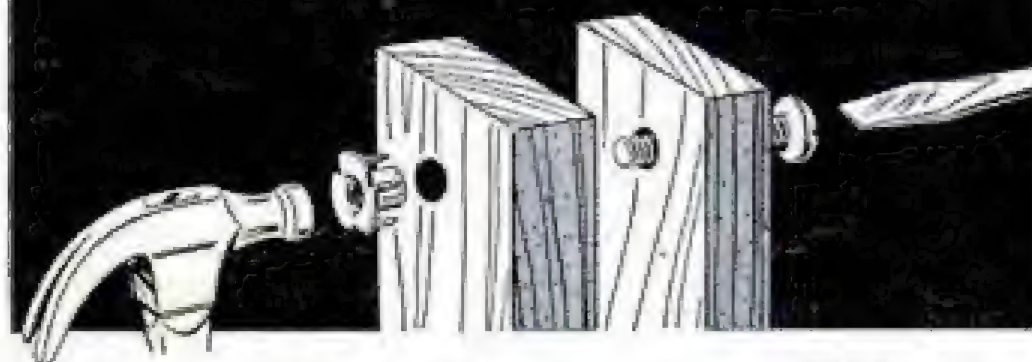
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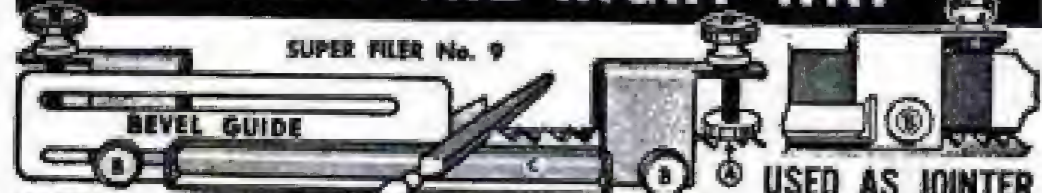


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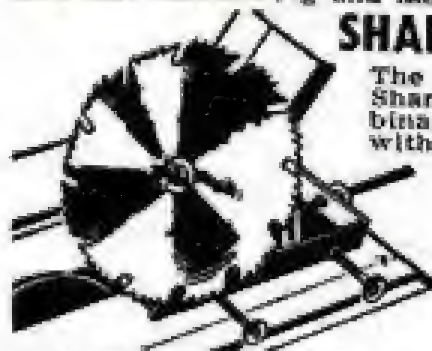
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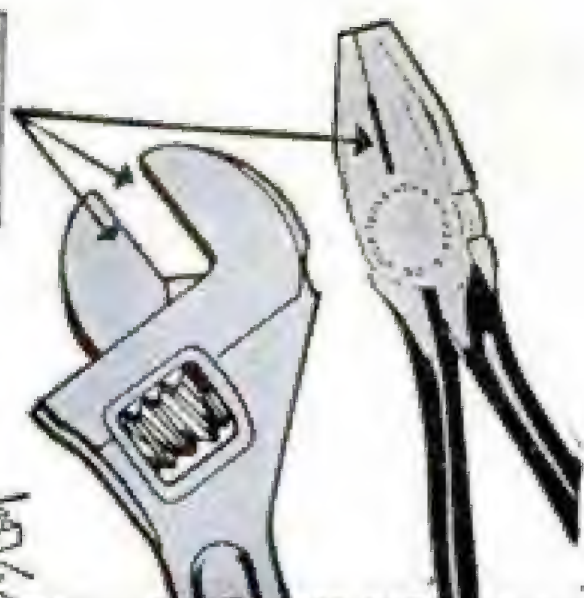
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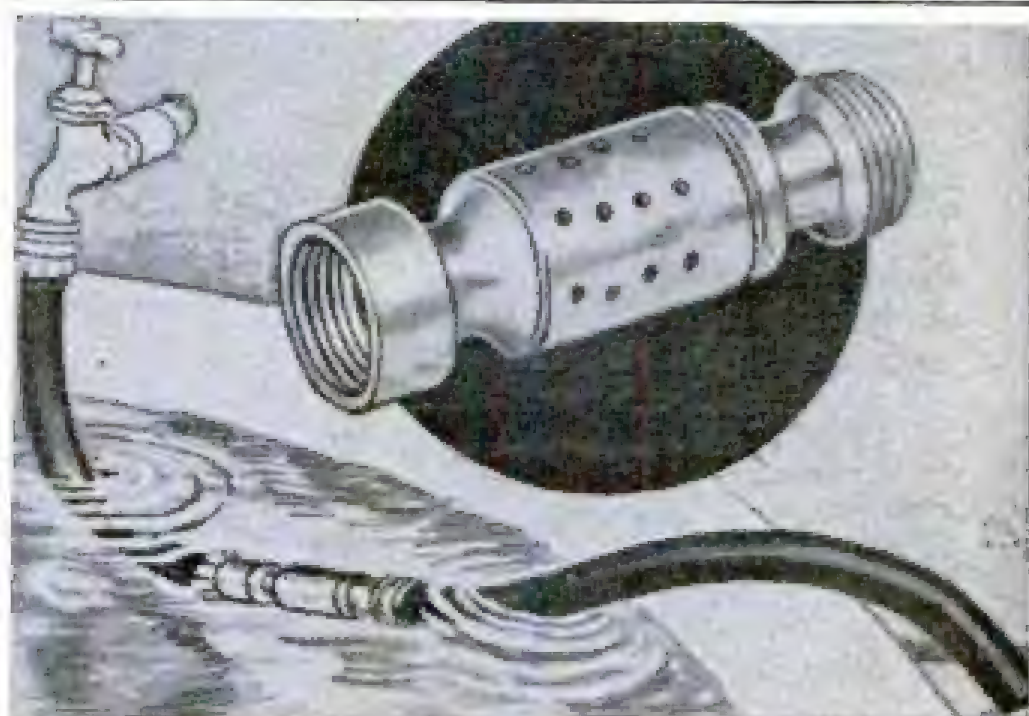
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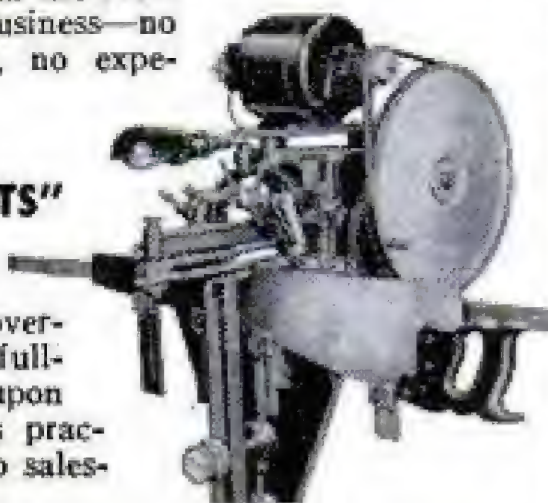
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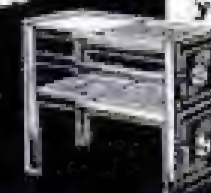
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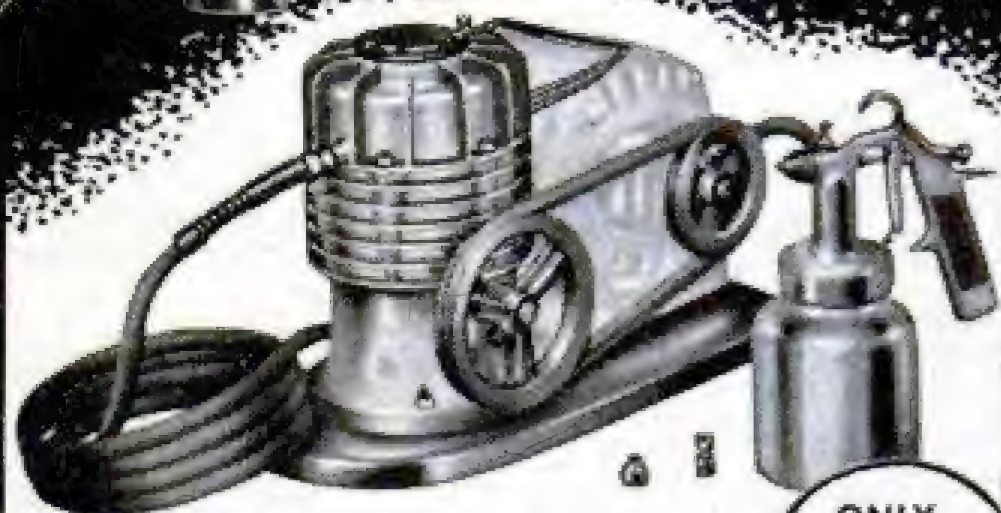


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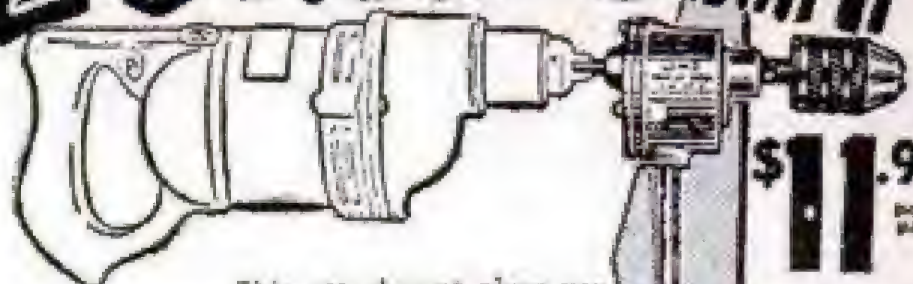
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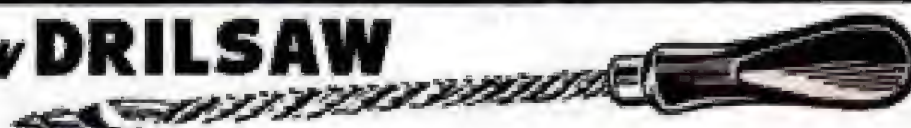
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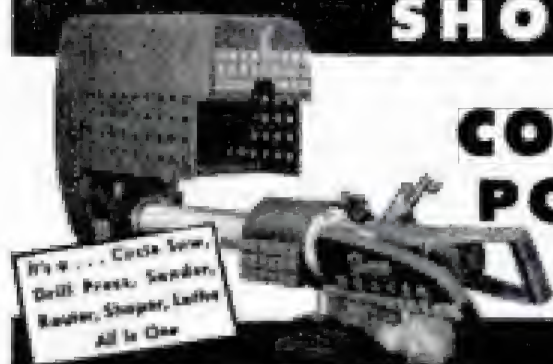
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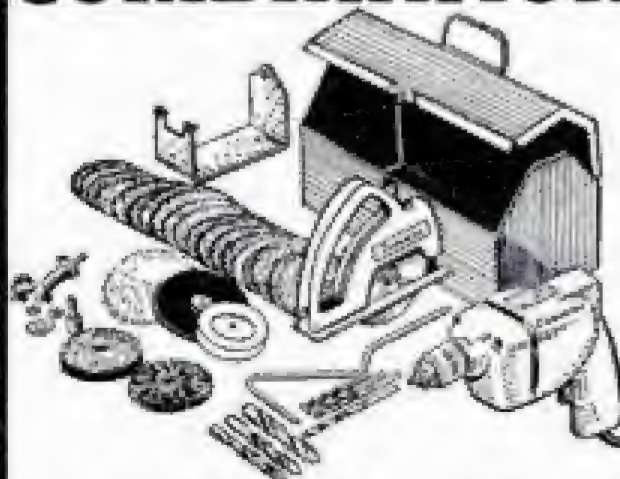


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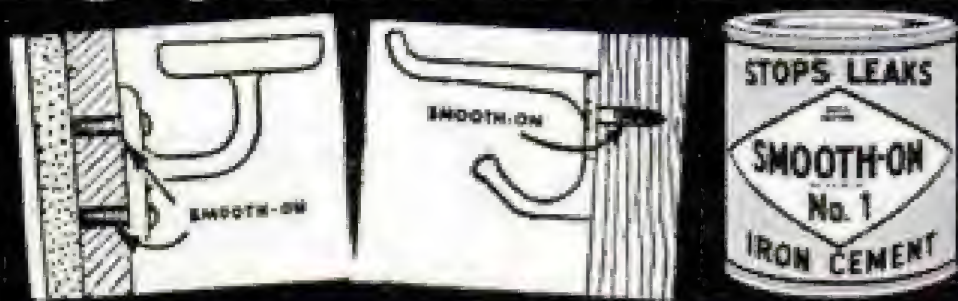
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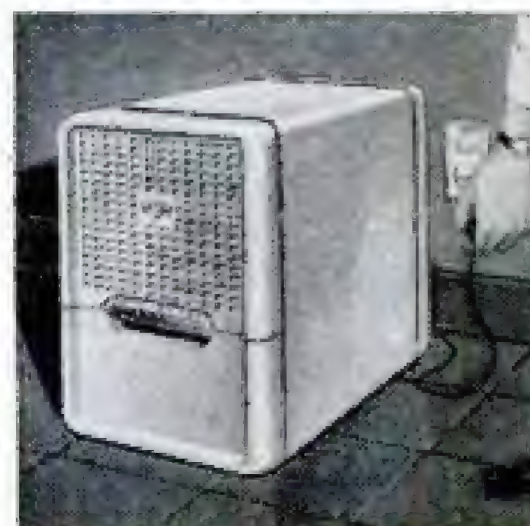
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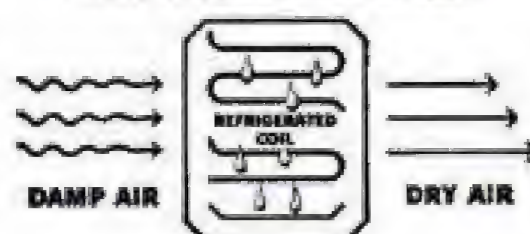
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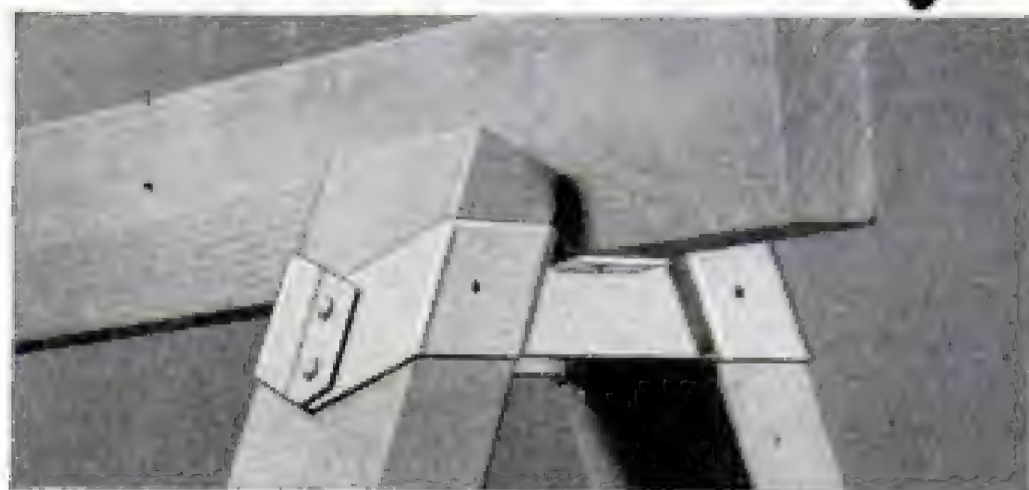
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PRECISION-  
ENGINEERED  
**NU-WAY**  
SAWHORSE  
BRACKETS

Set up or knock down sawhorses in jig time! Carry them in your car—or store them easily—the modern way . . . the NU-WAY!

SEE Your Hardware, Lumber or Paint dealer NOW!  
**ONLY \$1.50**  
Pair  
(\$1.60 West of Rockies)

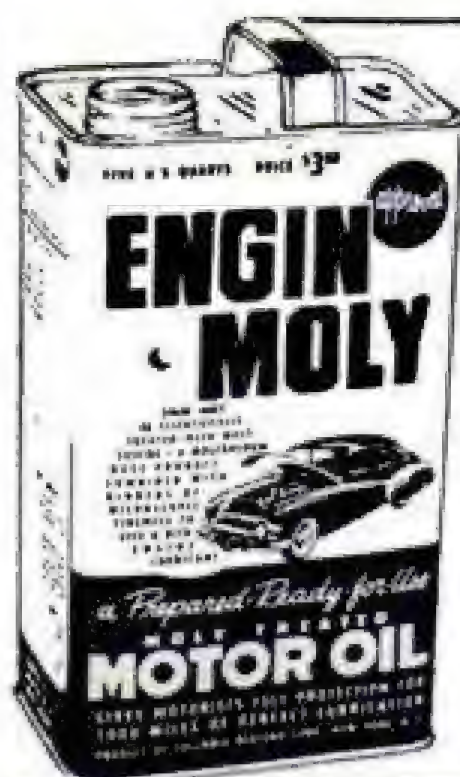
**THOMAS PRODUCTS CO.**, 8490 Lyndon Ave., Detroit 21, Mich.



The new Evans "White-Tape" has everything you'll find in tapes costing over \$1.50—plus.

- snow-white blade with bold, legible, jet-black numerals and graduations. Graduated in 32nds for first 6 inches.
- sturdy die-cast case heavily chrome-plated, calibrated for quick reading inside and outside measurements.
- blade 1/2" wide made of finest high carbon steel—tempered—Bonderized—enamelled—baked.
- blade replaceable in seconds—without tools—without even opening case. And Evans replacements cost far less.
- every Evans "White-Tape" is unconditionally guaranteed.
- exclusive Evans automatic brake gives smoother push-pull action with absolutely no "creeping" of tape into case.
- underside is white, too. Mark with ordinary pencil, remove mark with flick of thumb.
- unheard-of low price\*: 10-ft. \$1.49; 8-ft. \$1.19; 6-ft. 98c. Prices higher in far west and Canada.

**Evans** & CO. • Elizabeth, N.J. • Montreal, Que. MADE IN U.S.A.  
Sold only through retailers.  
*Makers of Evans 6-ft. Folding Rule and "Folding Yardstick"*



NEW MIRACLE MOTOR OIL  
doubles car engine life

**ENGINE-MOLY**

Contains full treatment of Molybdenum (MoS<sub>2</sub>) that plates every friction surface of your car engine.

**5 QT. \$1.98**  
Can  
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ENGINE-MOLY motor oil is a combination of the highest quality premium oils plus Molybdenum (MoS<sub>2</sub>) in complete suspension. A perfect lubricant. Sold with a money back guarantee.

AVAILABLE AT YOUR LEADING ACCESSORIES STORE OR GARAGE  
**COLUMBIA-BEDFORD CORP.**  
N. Y., N. Y. EST. 1889

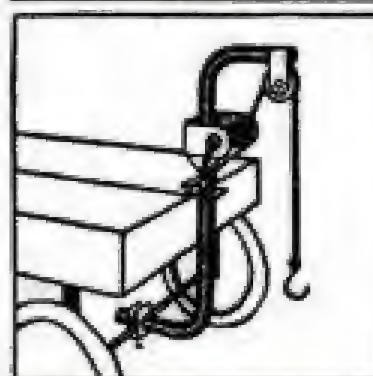
## The QUICK-WAY to SHARPEN CIRCULAR SAWS



Now you can do it yourself—save time and money. The new QUICK-WAY Index Plate Circular Saw Sharpener makes your own power table a precision saw sharpener. Guarantees accurate grinding and spacing of every tooth. Complete unit only \$16.50 postpaid, including patented Index Plate block for mitre and \$3.00 grinding wheel . . . Nothing else to buy!

Send check, cash or money order. We pay postage.

Model 6-12P **QUICK-WAY Saw Company**  
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Makes your wagon into a wrecker in a jiffy — fits any wagon — no holes to drill — durable steel construction.

Send cash, check or money order to **\$2.98**  
**KIDDY WRECKER** POSTPAID  
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Say You Saw It in Popular Mechanics

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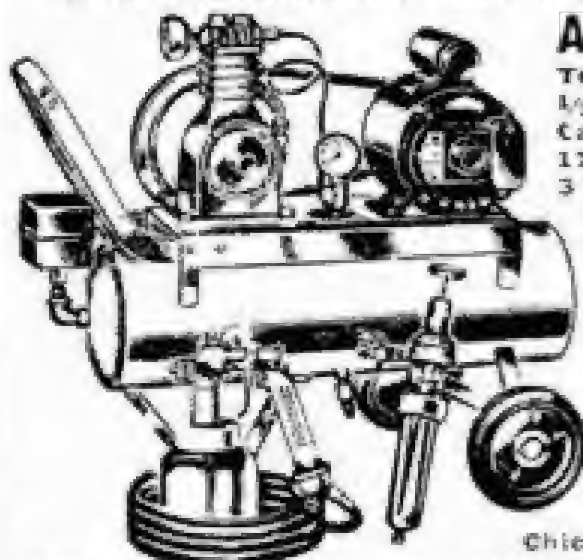


SAVE MONEY, be the envy of your neighbors by making this beautiful bedroom suite yourself! Only a power saw and jointer are needed to turn out this smart suite, featuring bed with storage space, three-piece vanity with cosmetic compartment and makeup mirror, Mr. and Mrs. dresser, and twin night stands with drawers. Letters demanding detailed plans poured in after this furniture was pictured in Popular Mechanics Magazine. Now the 4 plans are ready—easy-to-follow scale drawings—and they're yours for only \$2.00! Send for a complete set today.

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SAVE \$10.00 . . . 1/2 H.P. Outfit, knocked down, you assemble, #K-33 . . . Fob. Chicago. . . . . Only \$79.00



BIGGER, EXTRA HEAVY DUTY, AUTOMATIC AIR COMPRESSOR UNIT. BIG 1/2 H.P. HEAVY DUTY Capacitor A.C. 110/220-V Motor, Giant Stainless Steel Tank, 12 x 24 inches, 500 lb. test. Bigger Precision Air Compressor, 2 in. bore x 2 in. stroke, 3.5 CFM. pressures to 150 lbs. Big 10 x 175 Rubber Tired Ball Bearing Wheels, plus all accessories and parts listed above. Completely assembled into a Compact Balanced Unit. Ready to use, 1/2 H.P. #A-55 Fob. Chicago. . . . . Only \$117.00  
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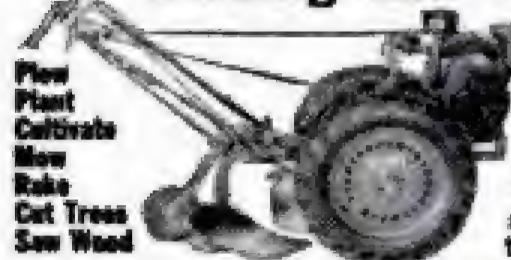
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Low-Cost  
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"DU-ALL"

### Walking and Riding Tractors



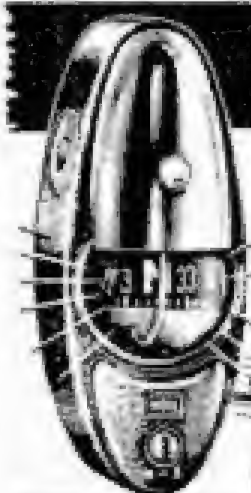
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Ideal for Trucks, Service Shops, Motels, Restaurants, Farms, and similar uses. Now you can have the advantages of the new reflecting signs and displays—get sales results 24 hours a day—with the amazing new Safe-T-Glow products.

**DIE CUT LETTERS—NUMERALS** Complete with full instructions and symbols to construct signs of professional quality.

Specify red or silver.

1 INCH WIDE STRIPS—30c per ft.

2 inch	10c ea.
3 inch	18c ea.
4 inch	25c ea.
6 inch	50c ea.

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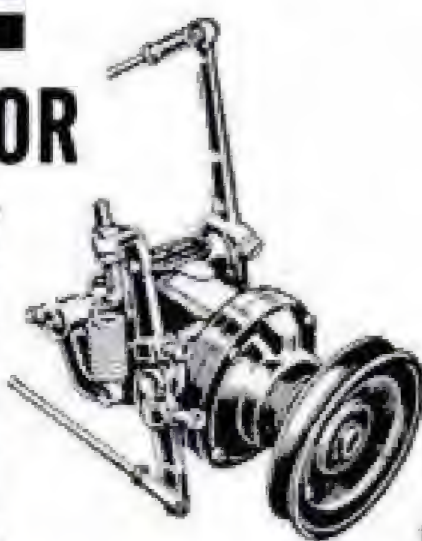
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ONLY  
**\$39.50**

Pulley extra  
Send Check or  
Money Order.  
State Make,  
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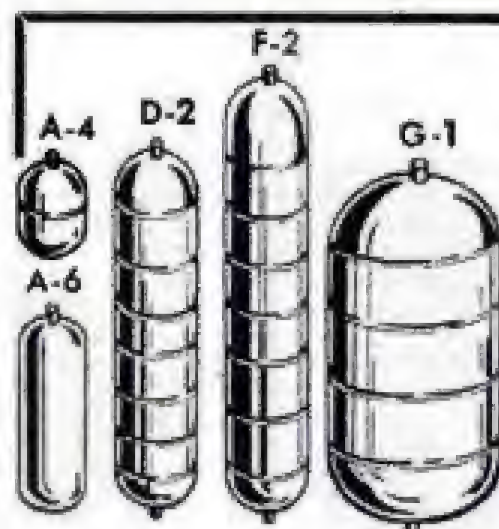
- Covers 550 to 1600 KC with Exclusive Tuning Unit
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- Low drain powerful acorn tube
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**\$5.99**  
Postpaid

This neatly engineered little KIT was designed to give you a real personal, portable radio that you can enjoy anywhere without disturbing others. Use it on camping trips, in bed, in your office or just anywhere. Remember this is not a weak crystal set but a powerful VACUUM TUBE receiver that will give you good local and long distance reception. Set, less batteries, ONLY \$5.99 postpaid. A deposit of \$1.00 is acceptable in U.S. and possessions on COD orders. If batteries are desired we will supply at only \$1.50 per set including extra "A" battery. These are obtainable at local hearing aid concerns. 1,500 ohm Alnico magnet receiver \$1.45 only, when purchased with KIT. All parts fully guaranteed.

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Steel pressure tanks suitable for compressors, pneumatic units, gases, hydraulics, and liquids. Rated at 500 lbs. per square inch pressure. 1/4" standard pipe thread openings on tank ends as shown.

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F-2	Stainless Steel	New	45" x 6"	11	1000 cu. in.	9.50
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IRRIGATE—FILL TANKS—DRAW WELL WATER

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A "Stanley Tool Guide" — shows care and use of tools for all woodworking jobs plus diagrams of wood joints and cuts, charts on metal working. Over 200 illustrations. Send 25c today to: Stanley Tools, 363A Elm Street, New Britain, Connecticut.

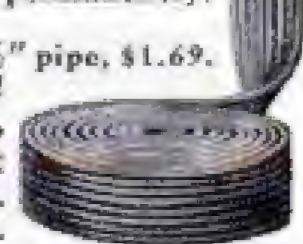


## STOP DRIP

caused from sweating or condensation on cold water pipes. Turn idle basement space into play, work or store rooms. Just wrap cork-filled NoDrip Tape around pipes and joints and the job's done—permanently.



Roll covers about 10 feet of 1/2" pipe, \$1.69. Higher west of Rockies and Canada. Get at Hardware, Paint, Dept. Stores, or sent postpaid. Write for free circular. J. W. Mortell Co., 522 Burch St., Kankakee, Ill.







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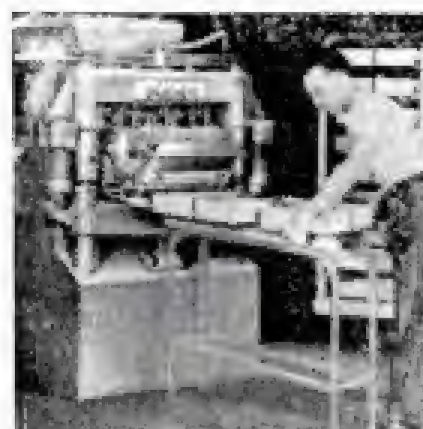
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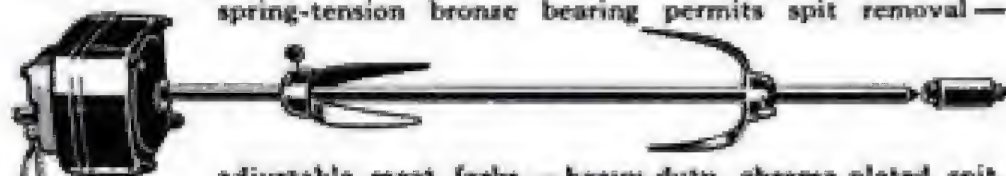


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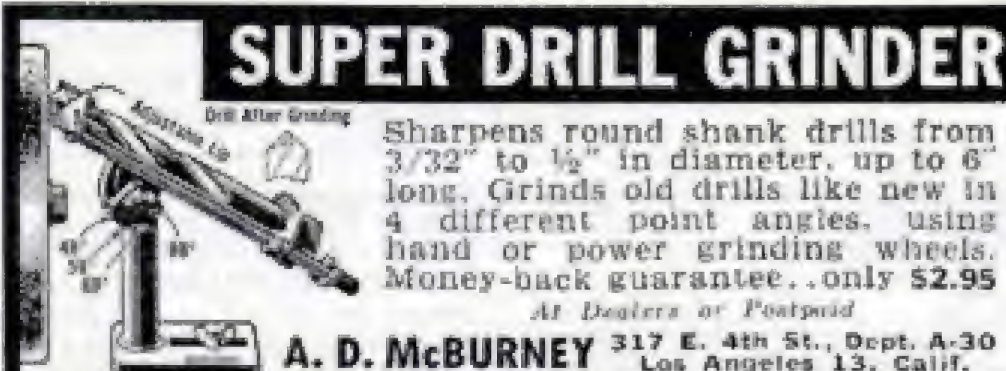
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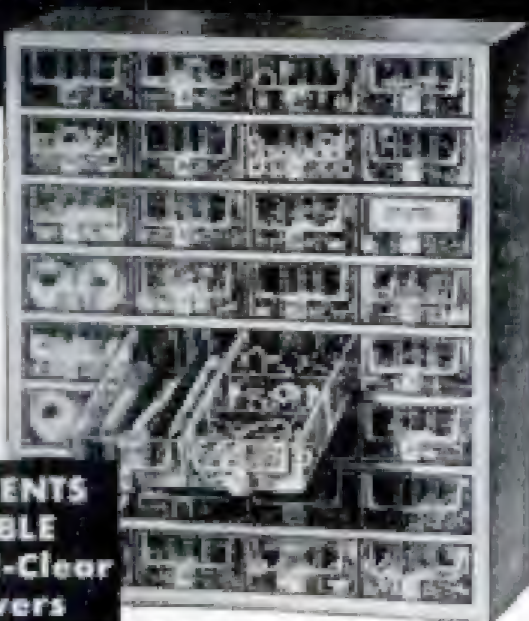
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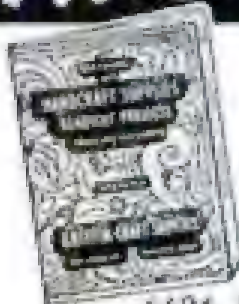


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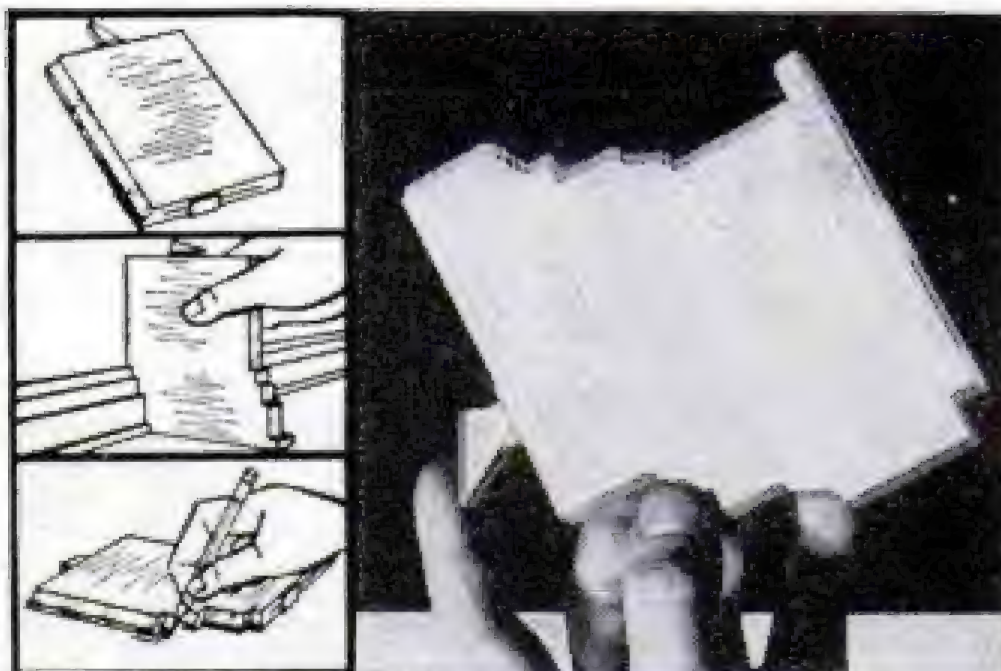


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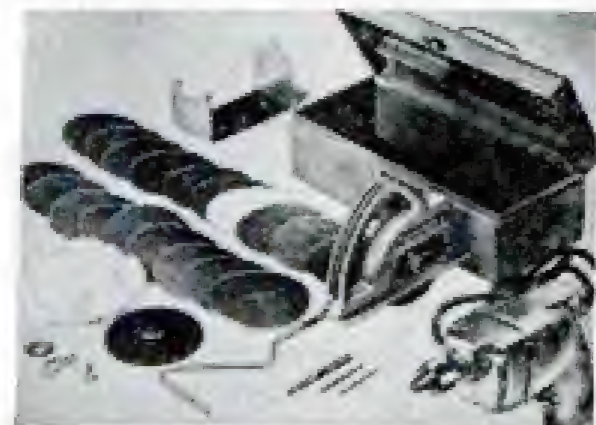
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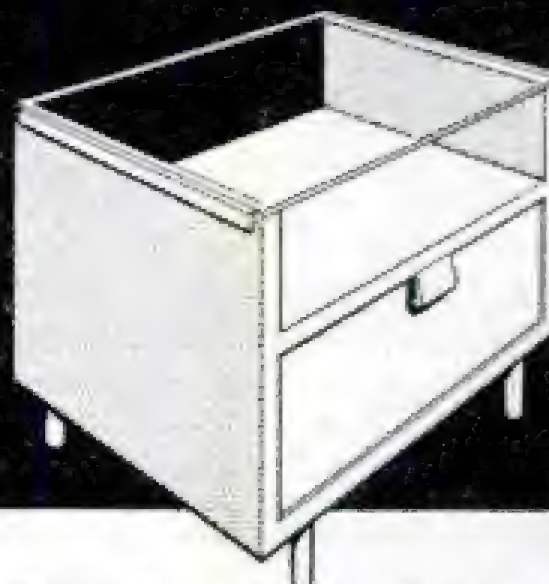
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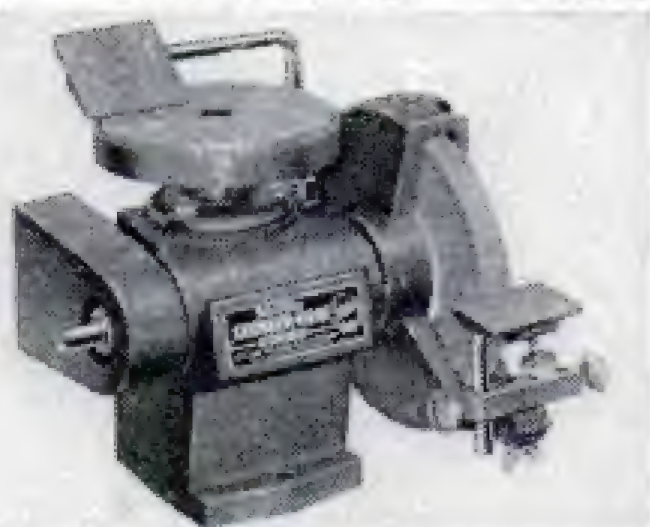
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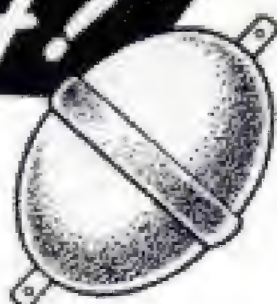
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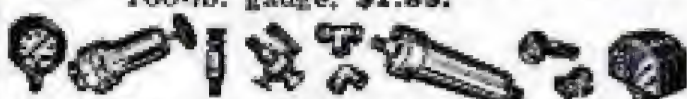
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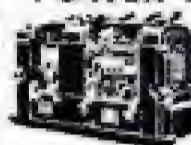


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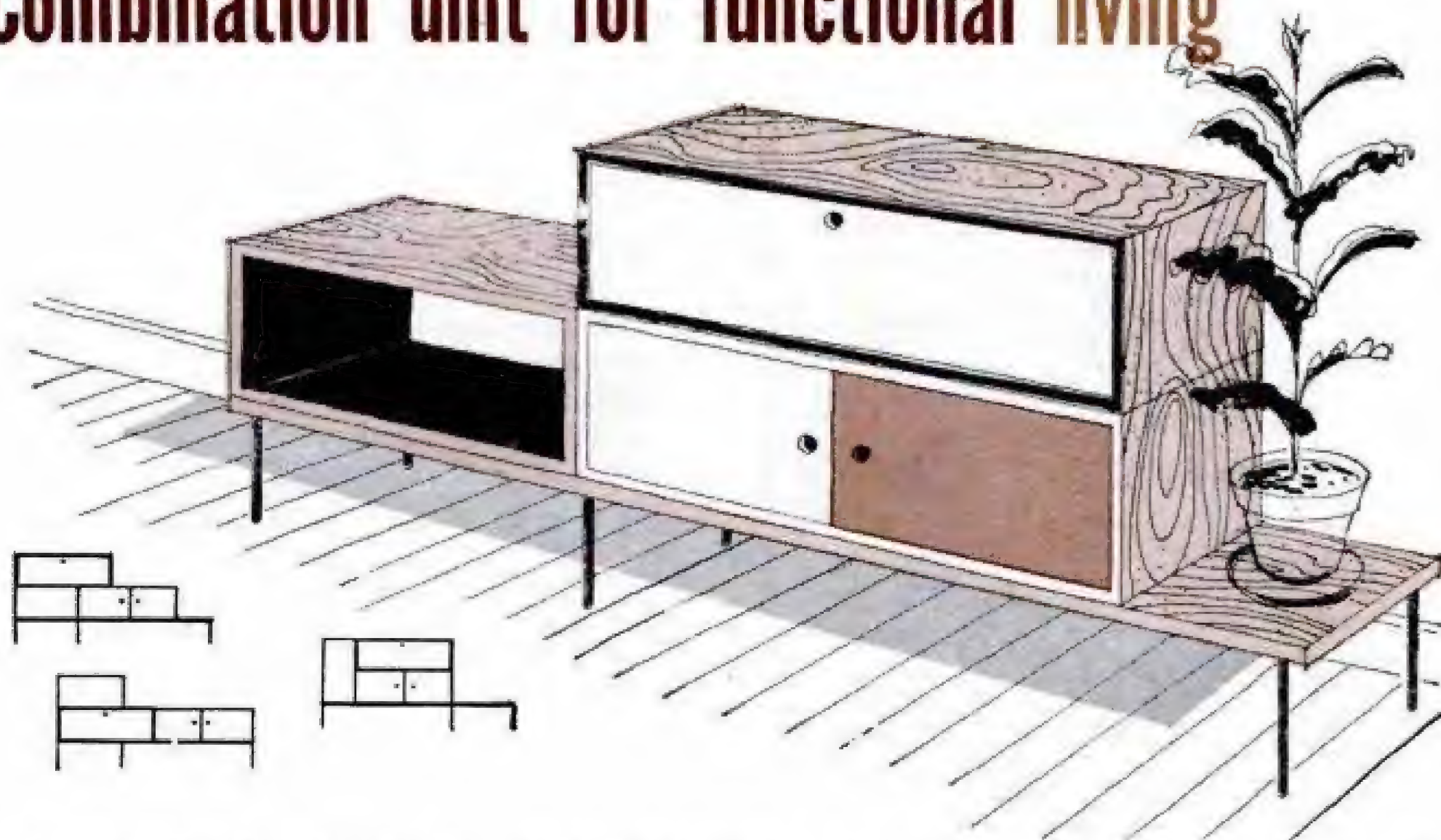
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# Combination unit for functional living



Designed to be functional as well as an attractive addition to the modern living room, this combination desk and storage unit has many features to recommend it. Easily built of available materials, using only simple tools, it combines flexibility of arrangement with maximum utility.

Essentially, this combination unit consists of three elements—(1) Base, with either wood or wrought-iron legs; (2) Combination drop-leaf and sliding-panel cabinet; (3) Storage area with open front and back, that can be placed either vertically or horizontally.

Detailed plans and specifications are available. They in-

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Rez is easy to apply with brush, spray or wipe-on cloth

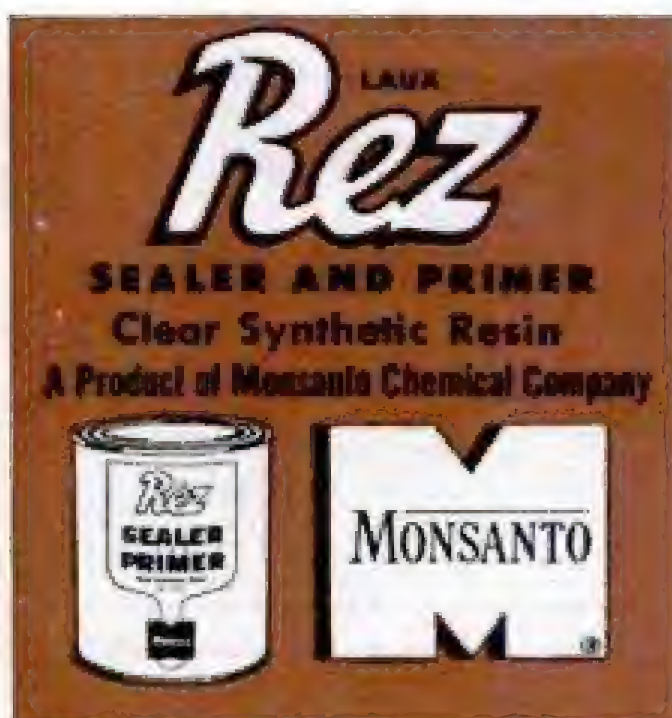
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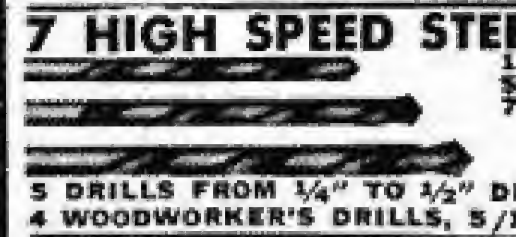


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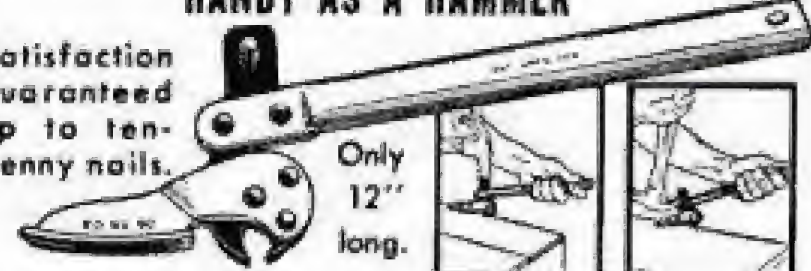
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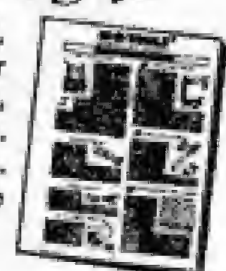
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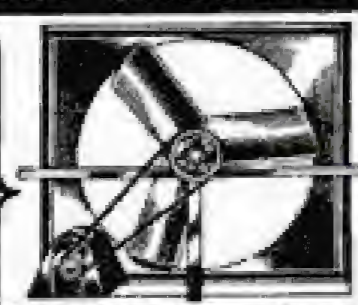
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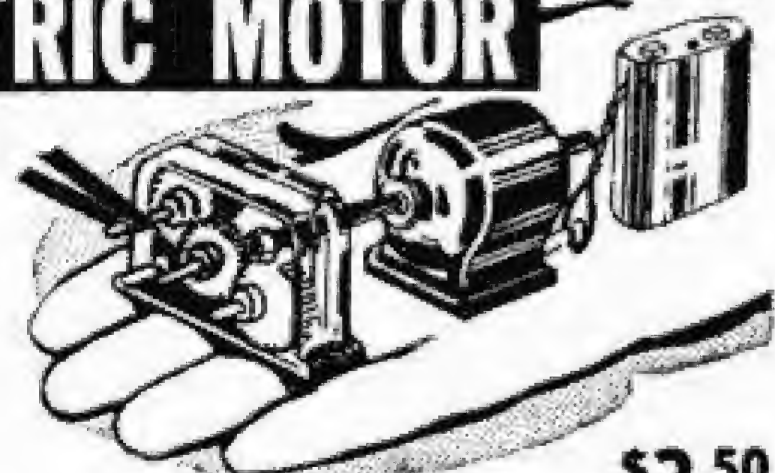
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1/8" - 7 1/2 ft. (7x19)	5/16" - 16 1/2 ft.
5/32" - 8 1/2 ft.	3/8" - 18 ft.
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**Stainless Steel Cable**  
 1/16" . . . 7 ft. | 5/32" . . . 20 ft.  
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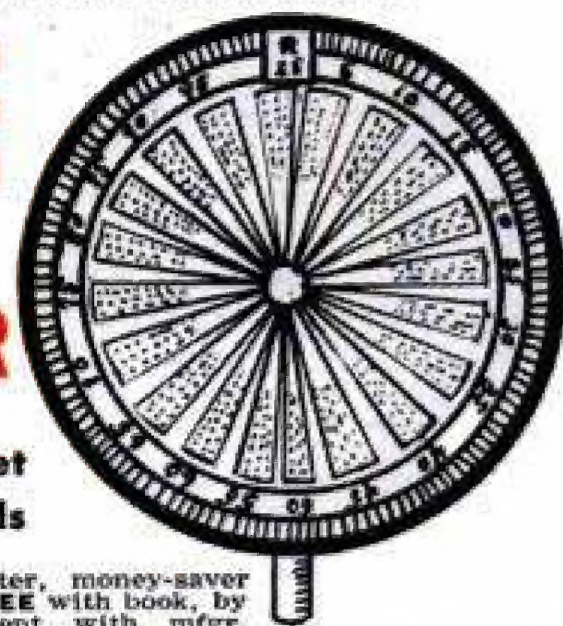
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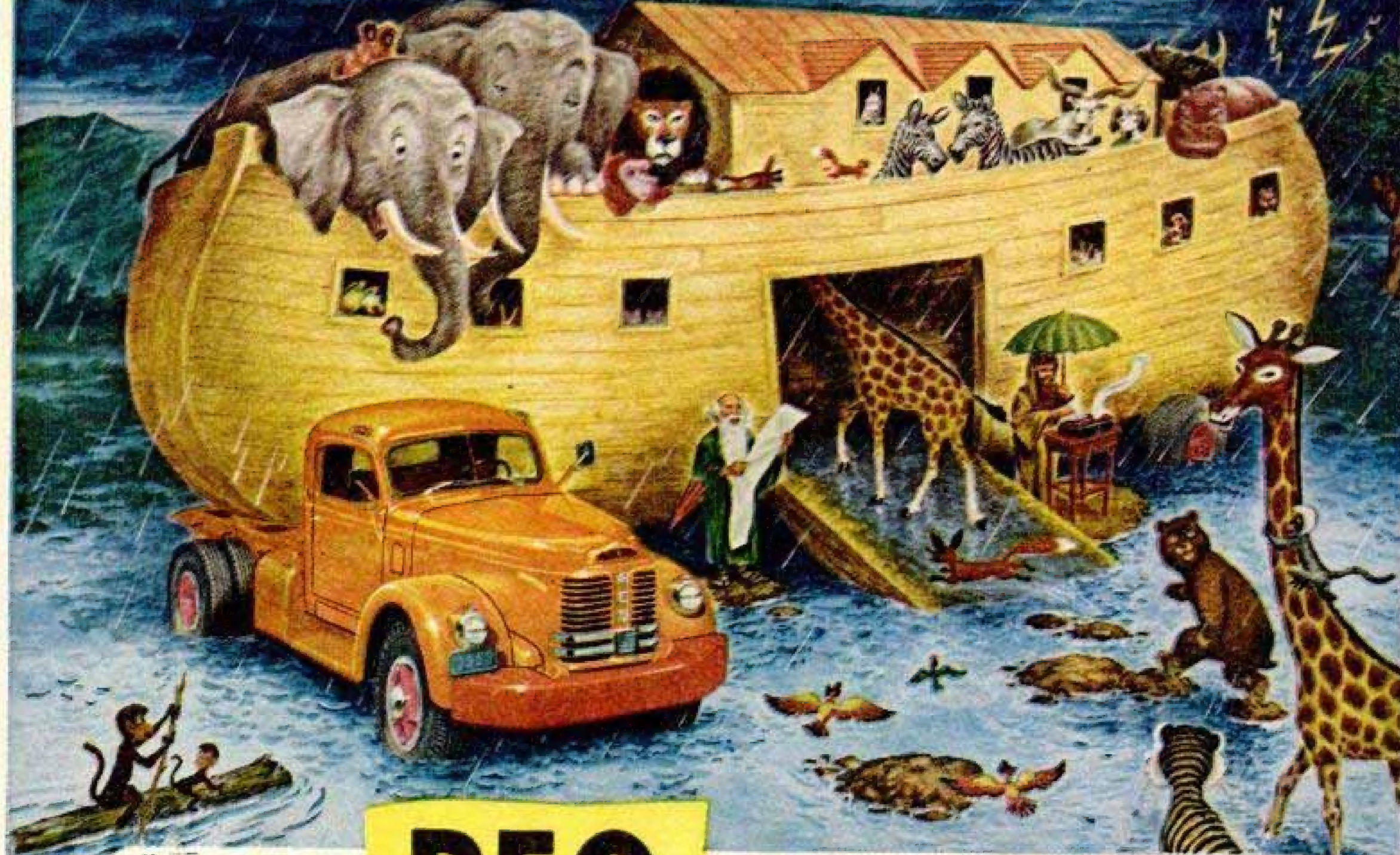
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